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Park et al.

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(54) **ELECTRONIC DEVICE INCLUDING PREVIEW IMAGES FOR BACKGROUND SCREEN FOR FLEXIBLE DISPLAY AND CONTROL METHOD THEREOF**

(71) Applicant: **Samsung Electronics Co., Ltd.**, Suwon-si (KR)

(72) Inventors: **Gyeongtae Park**, Suwon-si (KR); **Jooyoung Kang**, Suwon-si (KR); **Youngseong Kim**, Suwon-si (KR); **Yangsoo Choi**, Suwon-si (KR); **Sungmin Hong**, Suwon-si (KR); **Changryong Heo**, Suwon-si (KR)

(73) Assignee: **Samsung Electronics Co., Ltd.**, Suwon-si (KR)

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Jan. 20, 2021 (KR) 10-2021-0008252

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G09G 3/00 (2006.01)

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CPC ***G09G 3/035*** (2020.08); *G09G 2340/045* (2013.01); *G09G 2354/00* (2013.01)

(58) **Field of Classification Search**
CPC G09G 3/035; G09G 2340/045; G09G 2354/00; G09G 5/14; G06F 3/03;
(Continued)

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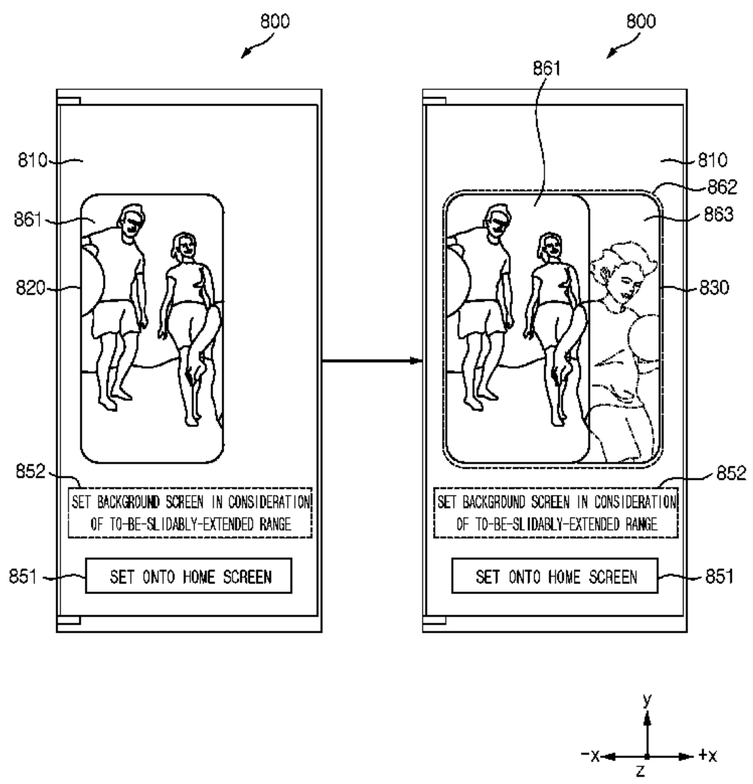
Primary Examiner — Richard J Hong
(74) *Attorney, Agent, or Firm* — Jefferson IP Law, LLP

(57) **ABSTRACT**

An electronic device comprises a display having a display area, a size of the display area visually exposed in a first state is reduced and a size of the display area visually exposed in a second state is enlarged, and a processor, the processor configured to acquire state information of the electronic device, successively display a first and a second preview images on the display, based on the state information of the electronic device, the first preview image includes a first area of a specified image and corresponds to a preview image of a background screen in the first state, the second preview image comprises a second area including the first area and a further area extending from the first area, and corresponds to a preview image of a background screen in the second state, and specify the image as a background screen, based on a first user input.

20 Claims, 18 Drawing Sheets



(58) **Field of Classification Search**
CPC G06F 3/0488; G06F 1/1652; G06F 1/1641; G06F 1/1626; G06F 1/3265; H04M 1/72427
See application file for complete search history.

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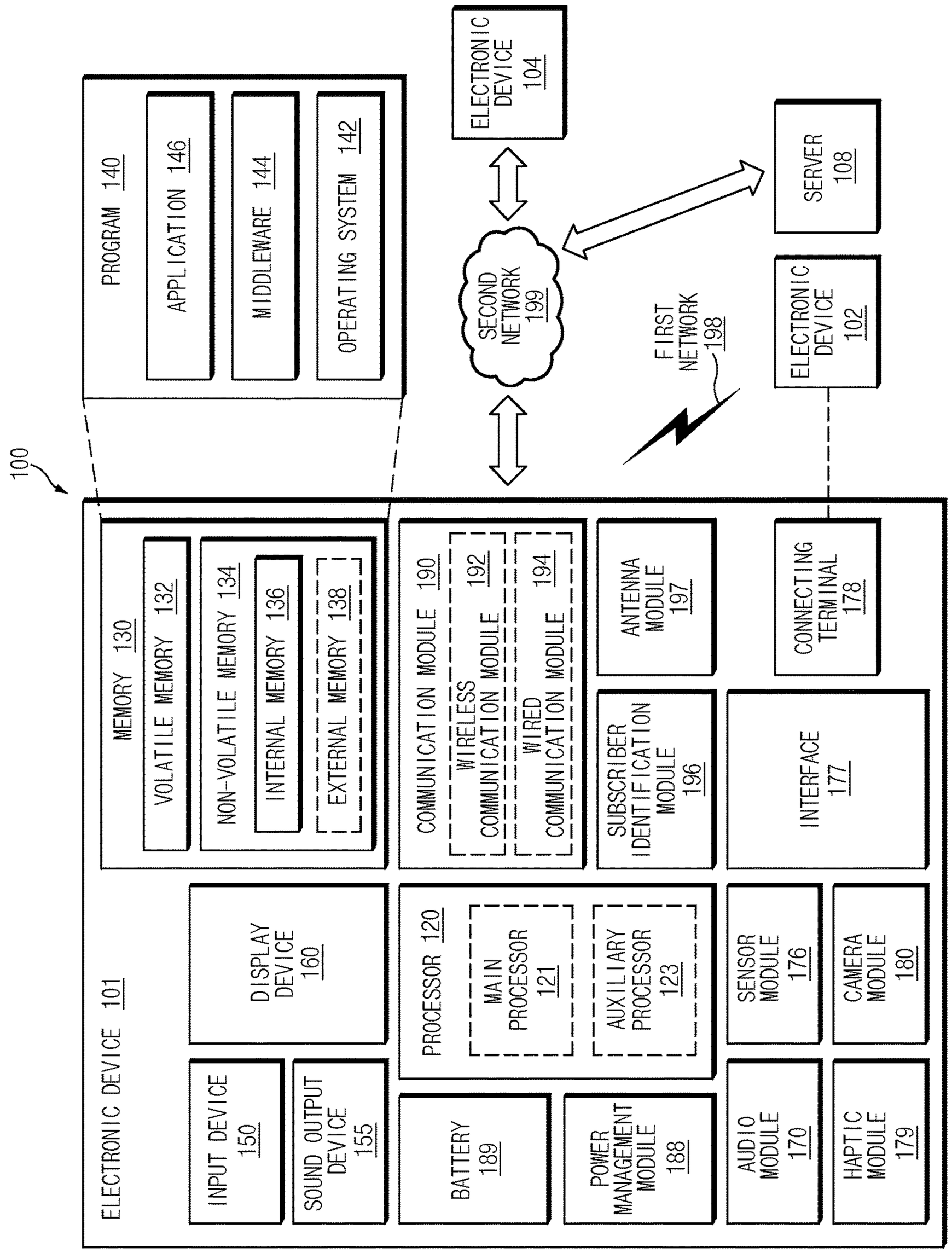

100
ELECTRONIC DEVICE 101
PROGRAM 140
APPLICATION 146
MIDDLEWARE 144
OPERATING SYSTEM 142
MEMORY 130
VOLATILE MEMORY 132
NON-VOLATILE MEMORY 134
INTERNAL MEMORY 136
EXTERNAL MEMORY 138
COMMUNICATION MODULE 190
WIRELESS COMMUNICATION MODULE 192
WIRED COMMUNICATION MODULE 194
ANTENNA MODULE 197
SUBSCRIBER IDENTIFICATION MODULE 196
INTERFACE 177
CONNECTING TERMINAL 178
INPUT DEVICE 150
DISPLAY DEVICE 160
SOUND OUTPUT DEVICE 155
PROCESSOR 120
MAIN PROCESSOR 121
AUXILIARY PROCESSOR 123
BATTERY 189
POWER MANAGEMENT MODULE 188
SENSOR MODULE 176
AUDIO MODULE 170
CAMERA MODULE 180
HAPTIC MODULE 179
ELECTRONIC DEVICE 104
SECOND NETWORK 199
FIRST NETWORK 198
SERVER 108
ELECTRONIC DEVICE 102

FIG. 1

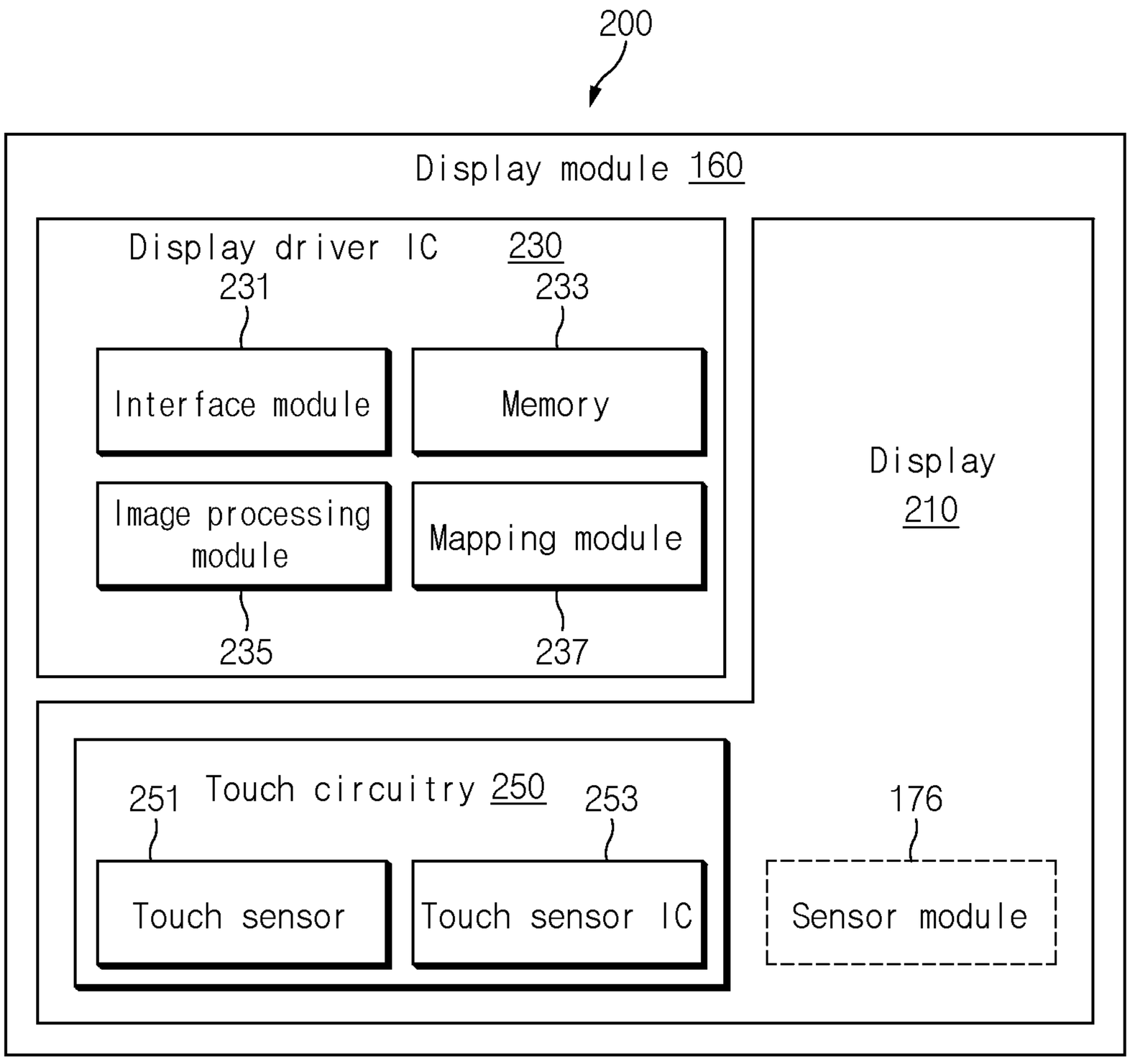

200
Display module 160
Display driver IC 230
231
233
Interface module
Memory
Image processing module
Mapping module
235
237
Display 210
Touch circuitry 250
251
253
Touch sensor
Touch sensor IC
176
Sensor module

FIG.2

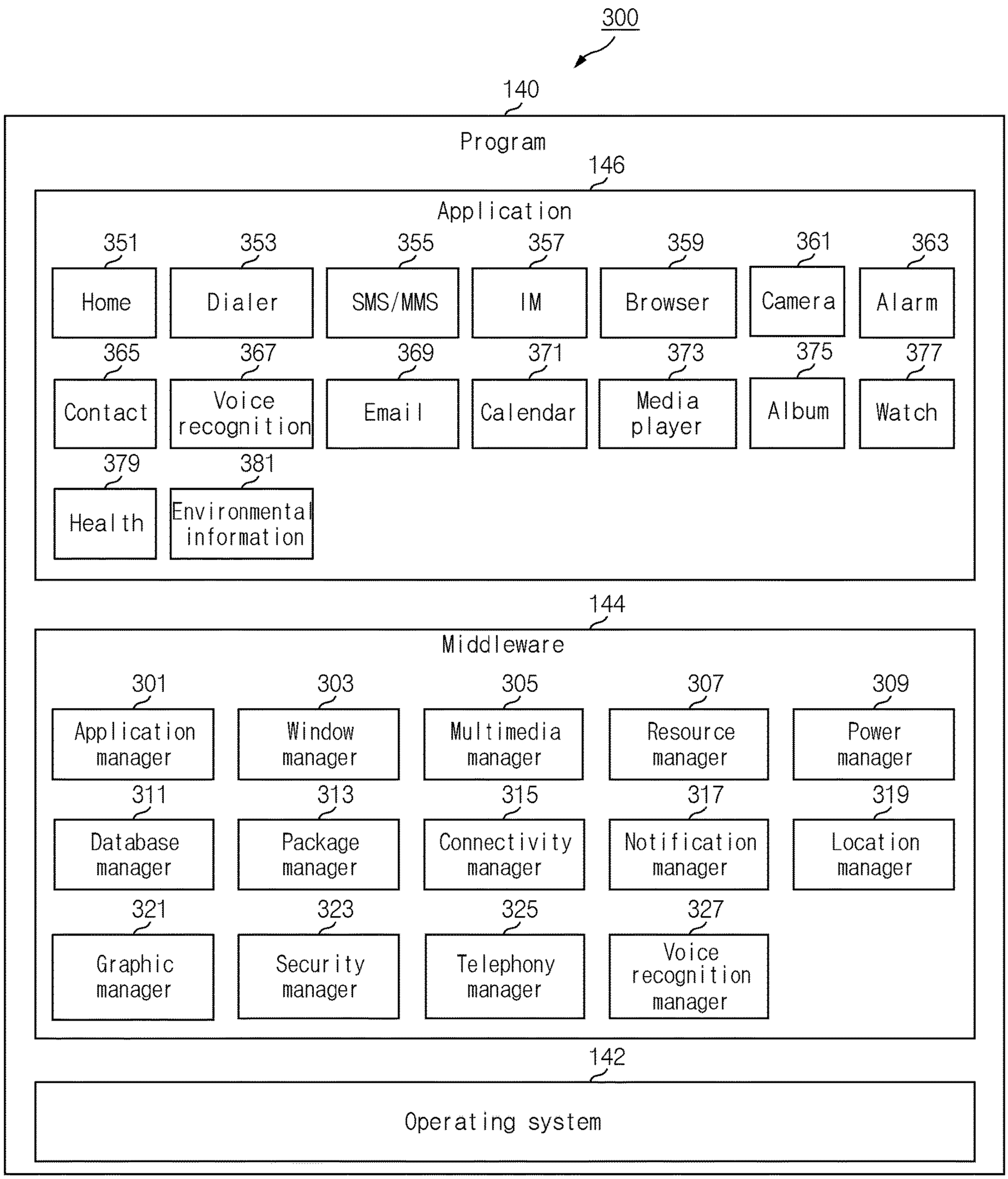

300
140
Program
146
Application
351
Home
353
Dialer
355
SMS/MMS
357
IM
359
Browser
361
Camera
363
Alarm
365
Contact
367
Voice recognition
369
Email
371
Calendar
373
Media player
375
Album
377
Watch
379
Health
381
Environmental information
144
Middleware
301
Application manager
303
Window manager
305
Multimedia manager
307
Resource manager
309
Power manager
311
Database manager
313
Package manager
315
Connectivity manager
317
Notification manager
319
Location manager
321
Graphic manager
323
Security manager
325
Telephony manager
327
Voice recognition manager
142
Operating system

FIG.3

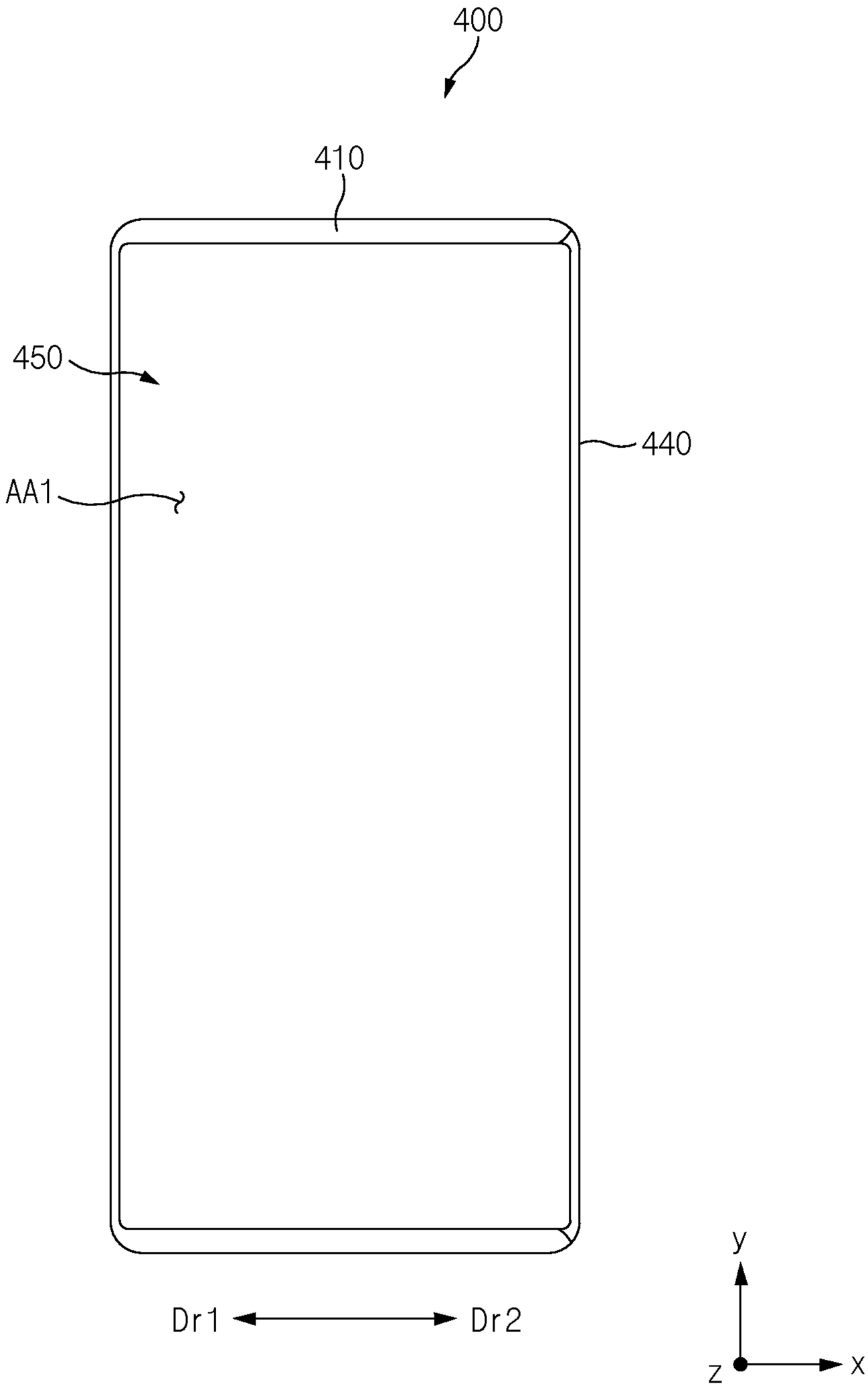


FIG.4

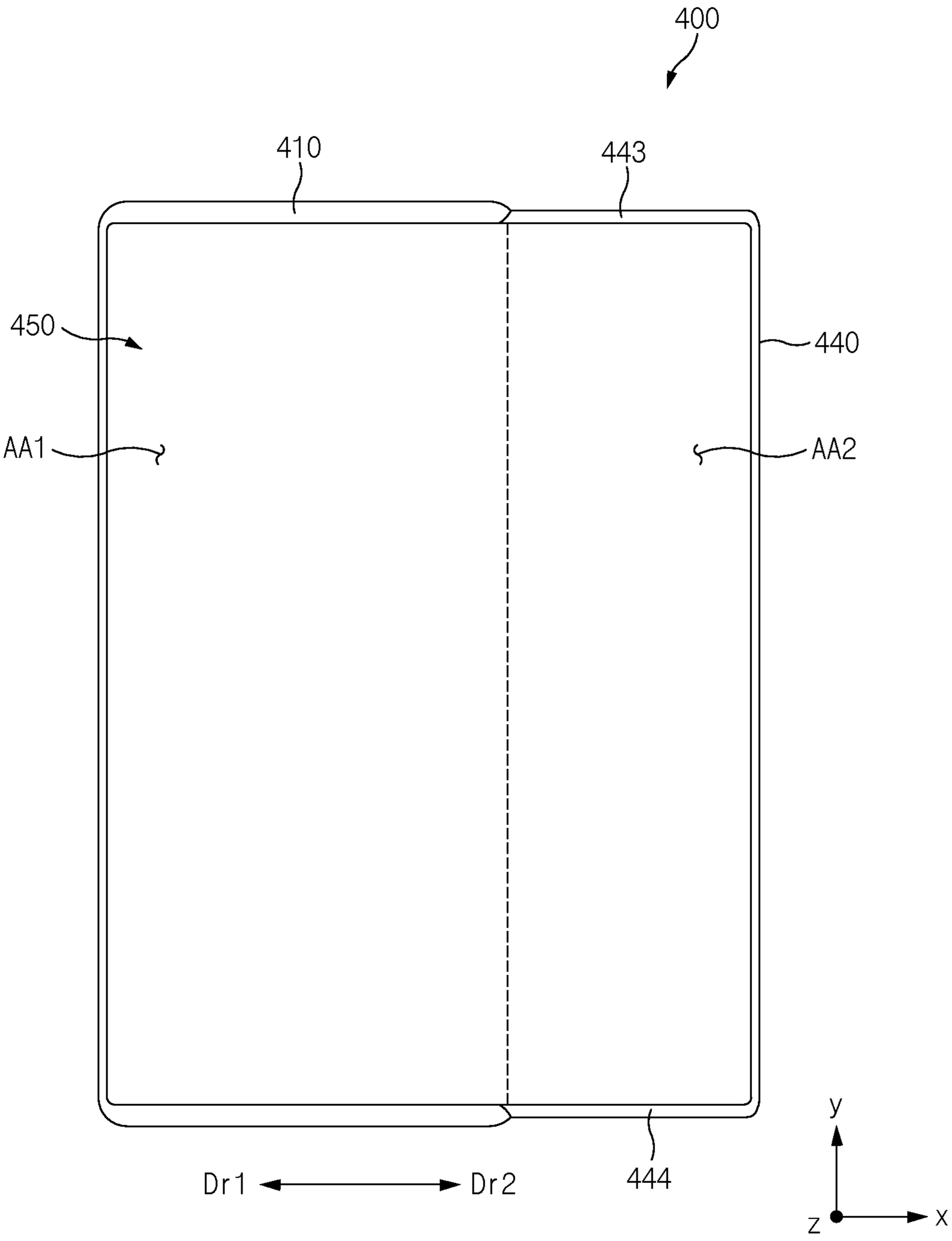


FIG.5

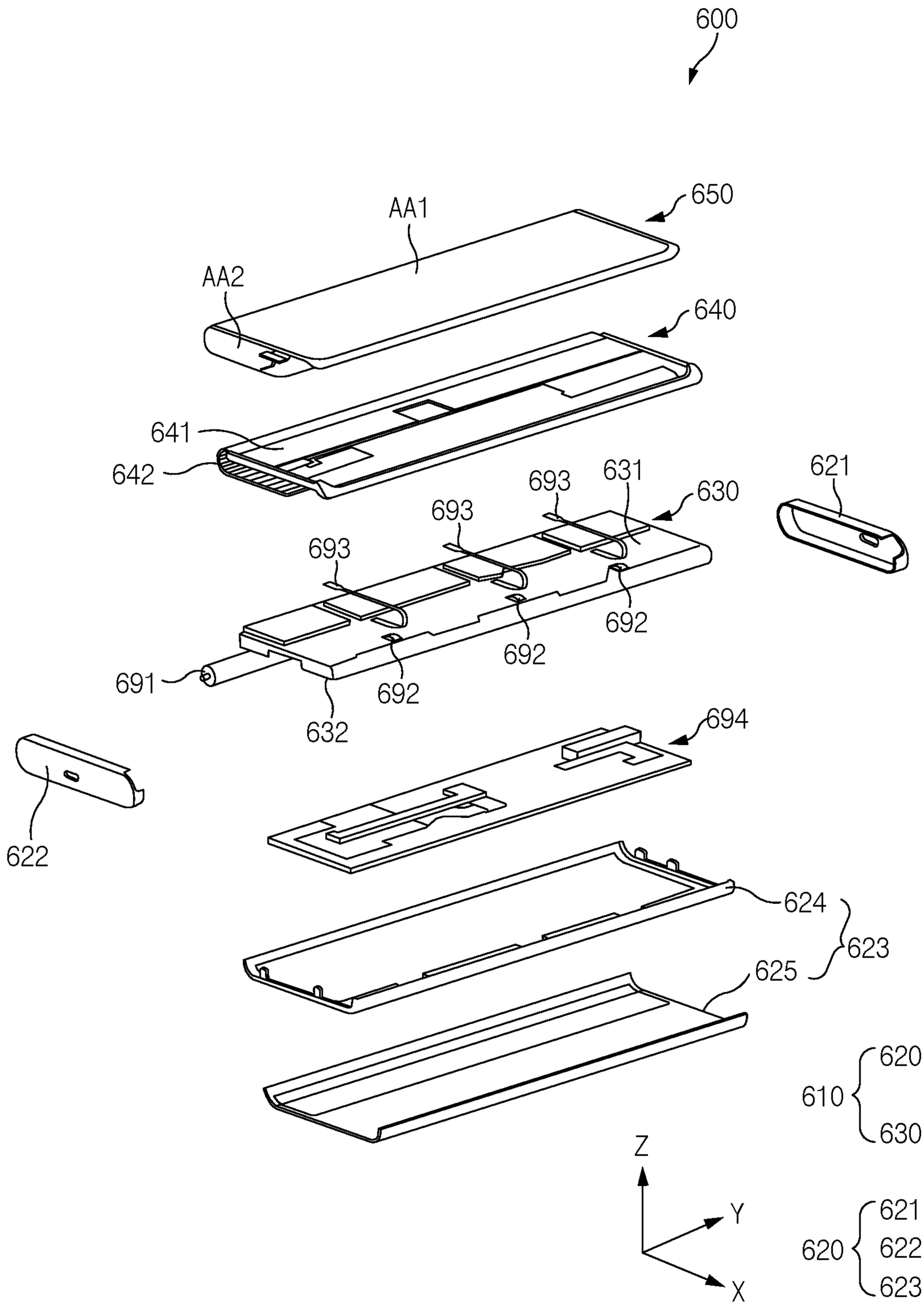

600
650
AA1
AA2
640
641
642
693
631
630
621
693
693
692
692
691
692
632
694
622
624
623
625
620
610
630
Z
Y
X
621
620
622
623

FIG.6

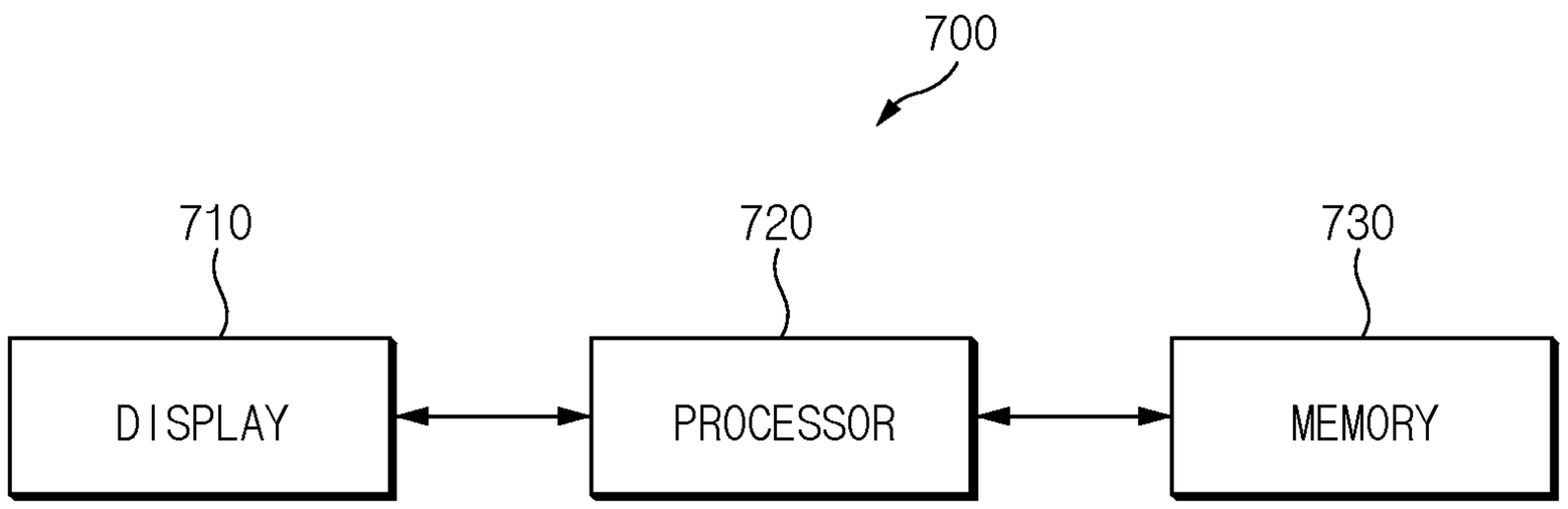


FIG.7

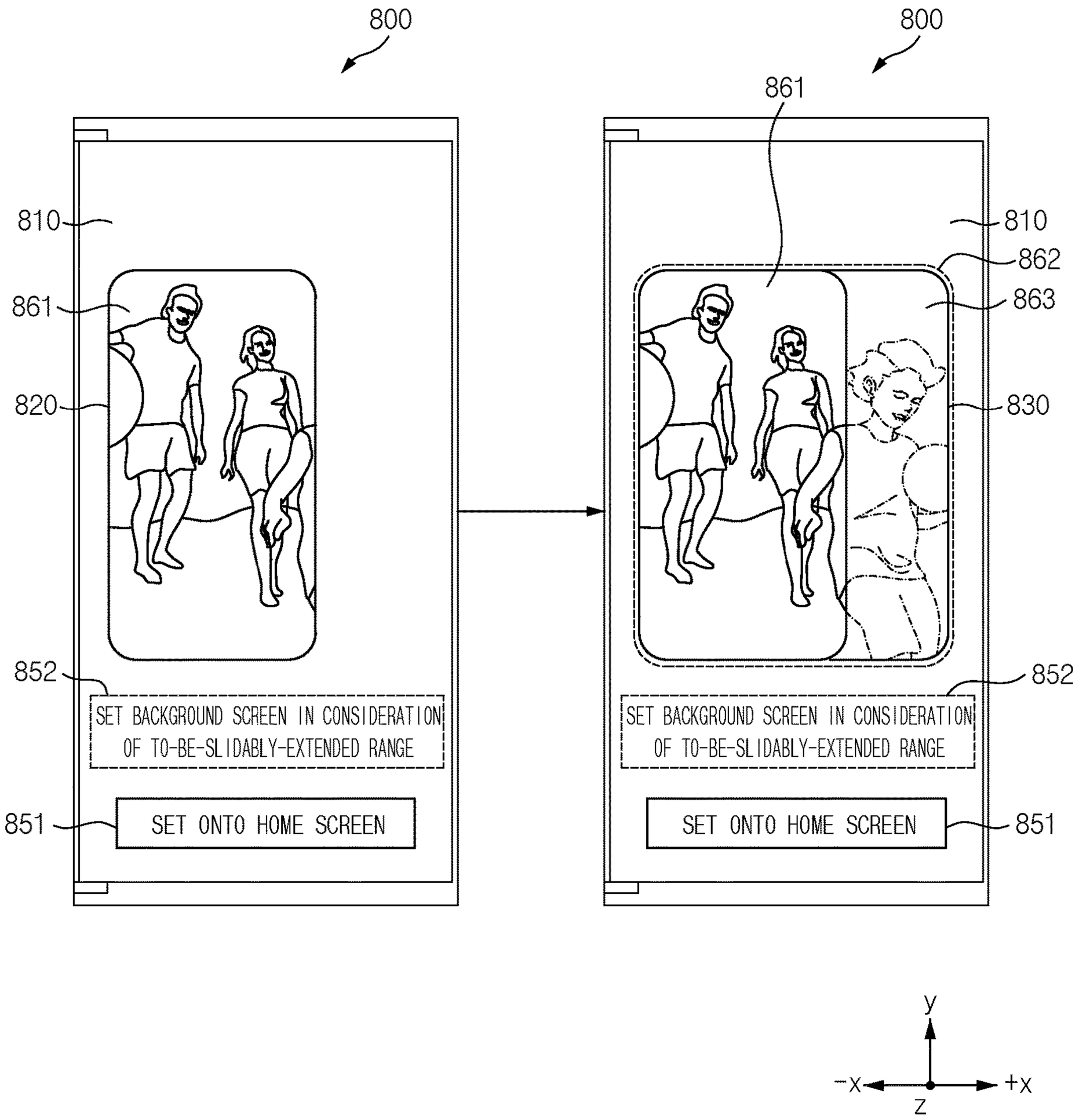

800
810
861
820
852
SET BACKGROUND SCREEN IN CONSIDERATION OF TO-BE-SLIDABLY-EXTENDED RANGE
851
SET ONTO HOME SCREEN
800
861
810
862
863
830
852
SET BACKGROUND SCREEN IN CONSIDERATION OF TO-BE-SLIDABLY-EXTENDED RANGE
SET ONTO HOME SCREEN
851
y
-x
+x
z

FIG.8

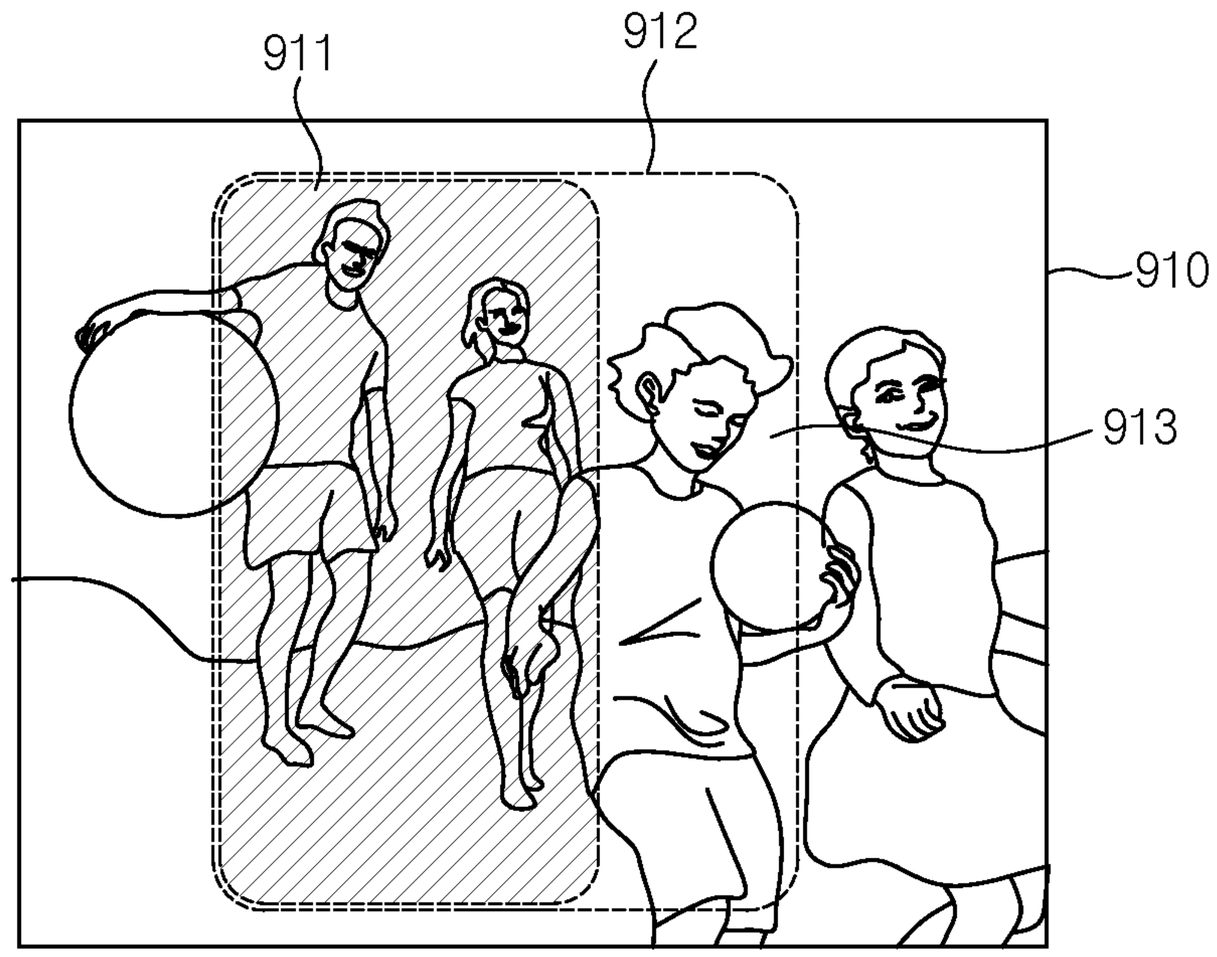


FIG.9

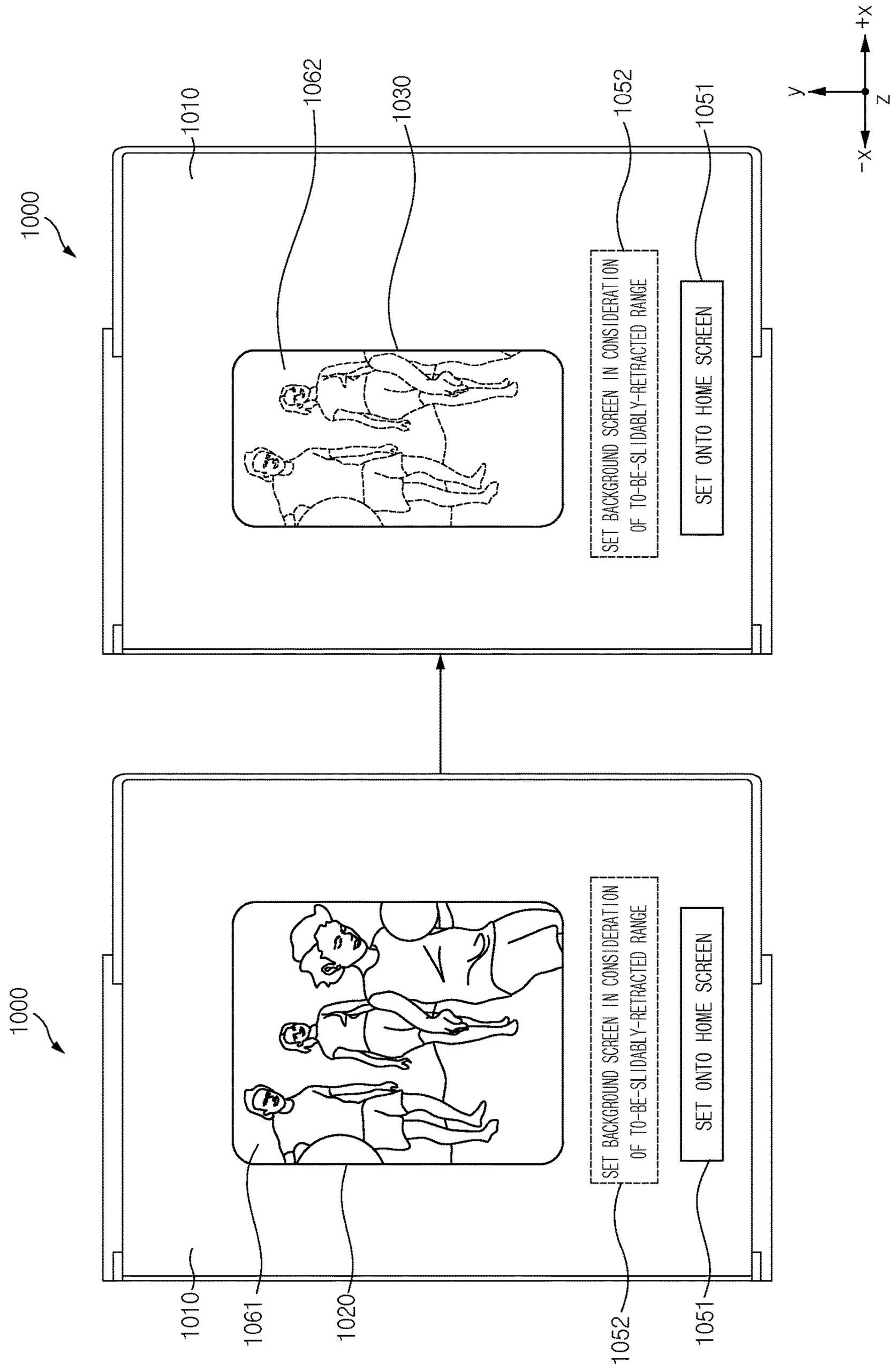
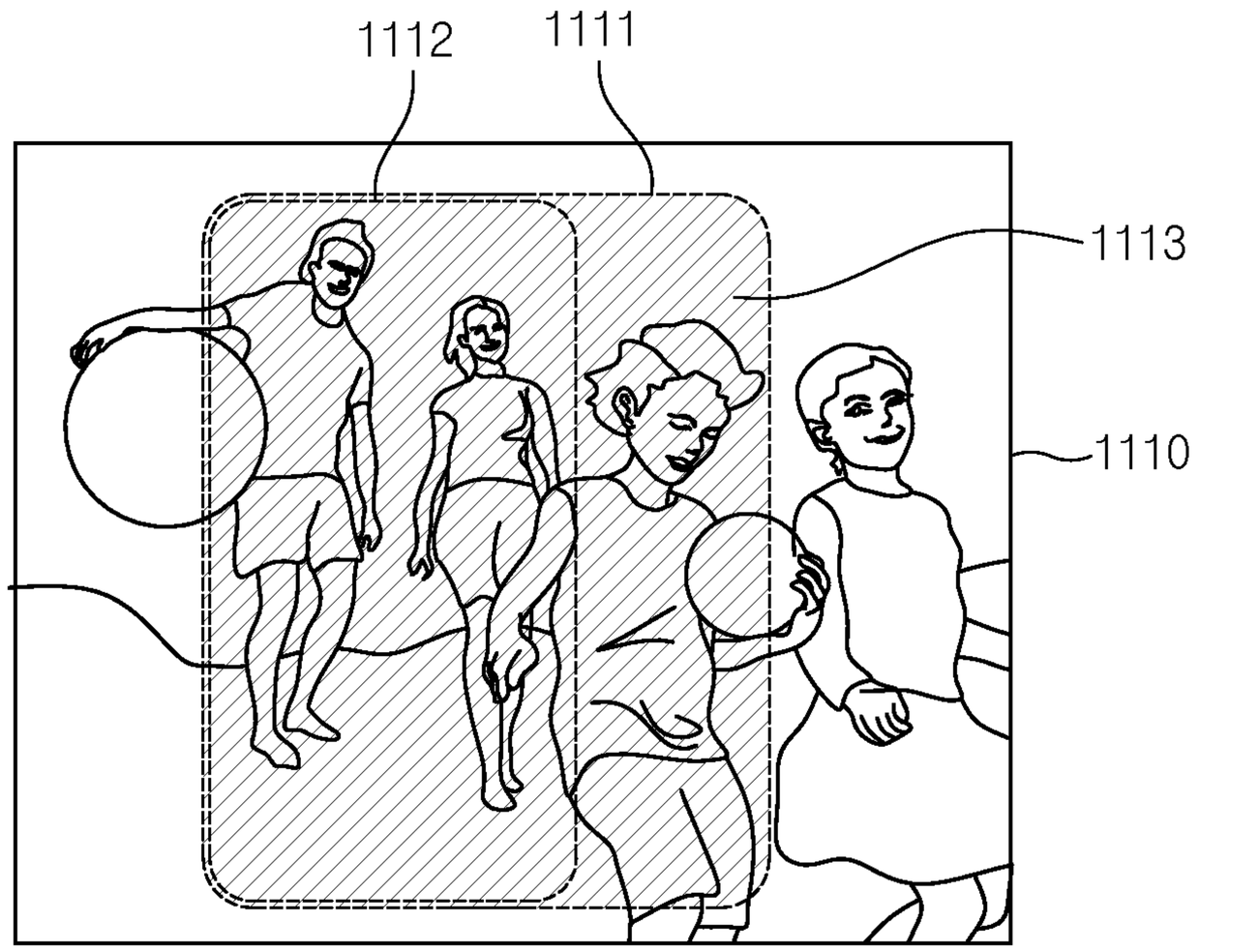

1000
1010
1062
1030
1052
1051
+X
-X
y
z
SET BACKGROUND SCREEN IN CONSIDERATION OF TO-BE-SLIDABLY-RETRACTED RANGE
SET ONTO HOME SCREEN
1000
1010
1061
1020
1052
1051
SET BACKGROUND SCREEN IN CONSIDERATION OF TO-BE-SLIDABLY-RETRACTED RANGE
SET ONTO HOME SCREEN

FIG. 10



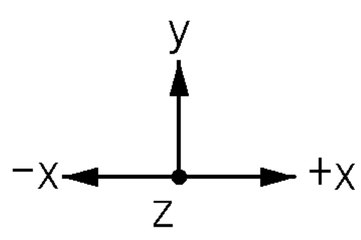


FIG.11

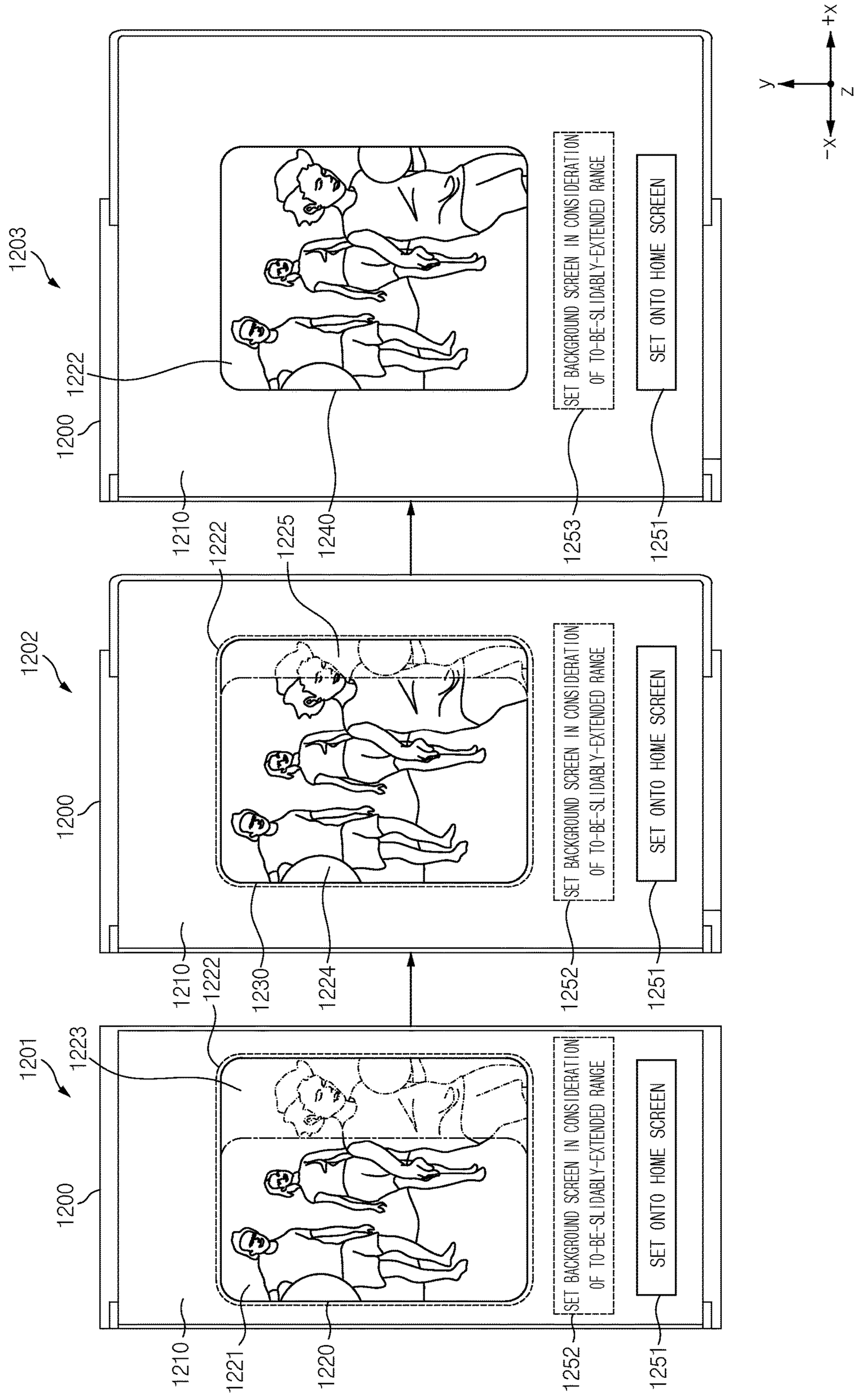

+X
y
z
-X
1203
1222
1200
1210
1240
SET BACKGROUND SCREEN IN CONSIDERATION OF TO-BE-SLIDABLY-EXTENDED RANGE
SET ONTO HOME SCREEN
1253
1251
1202
1225
1230
1224
1252
1201
1223
1221
1220

FIG. 12

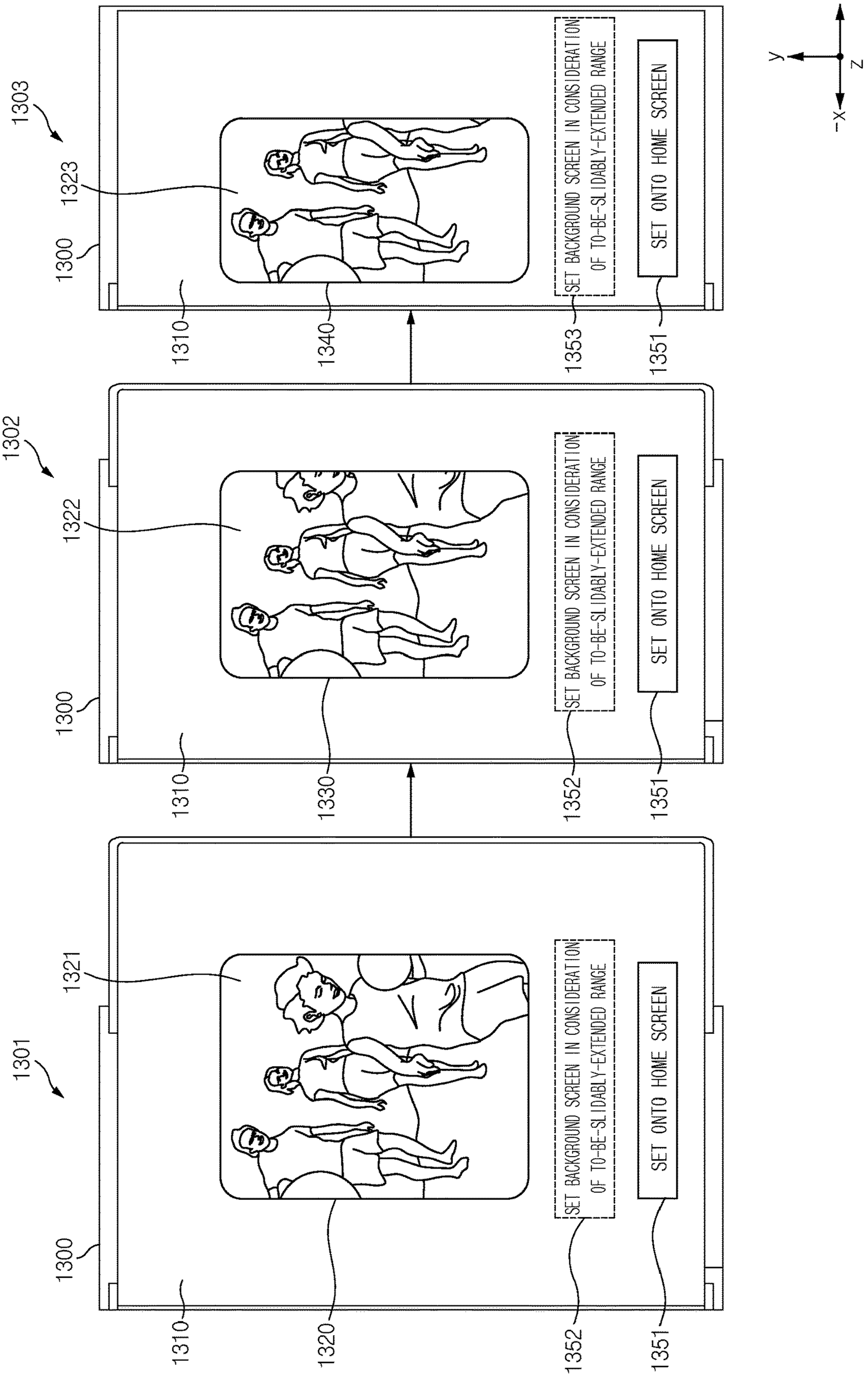

1303
1323
1300
1310
1340
SET BACKGROUND SCREEN IN CONSIDERATION OF TO-BE-SLIDABLY-EXTENDED RANGE
1353
SET ONTO HOME SCREEN
1351
1302
1322
1330
1352
1301
1321
1320
+X
-X
y
z

FIG. 13

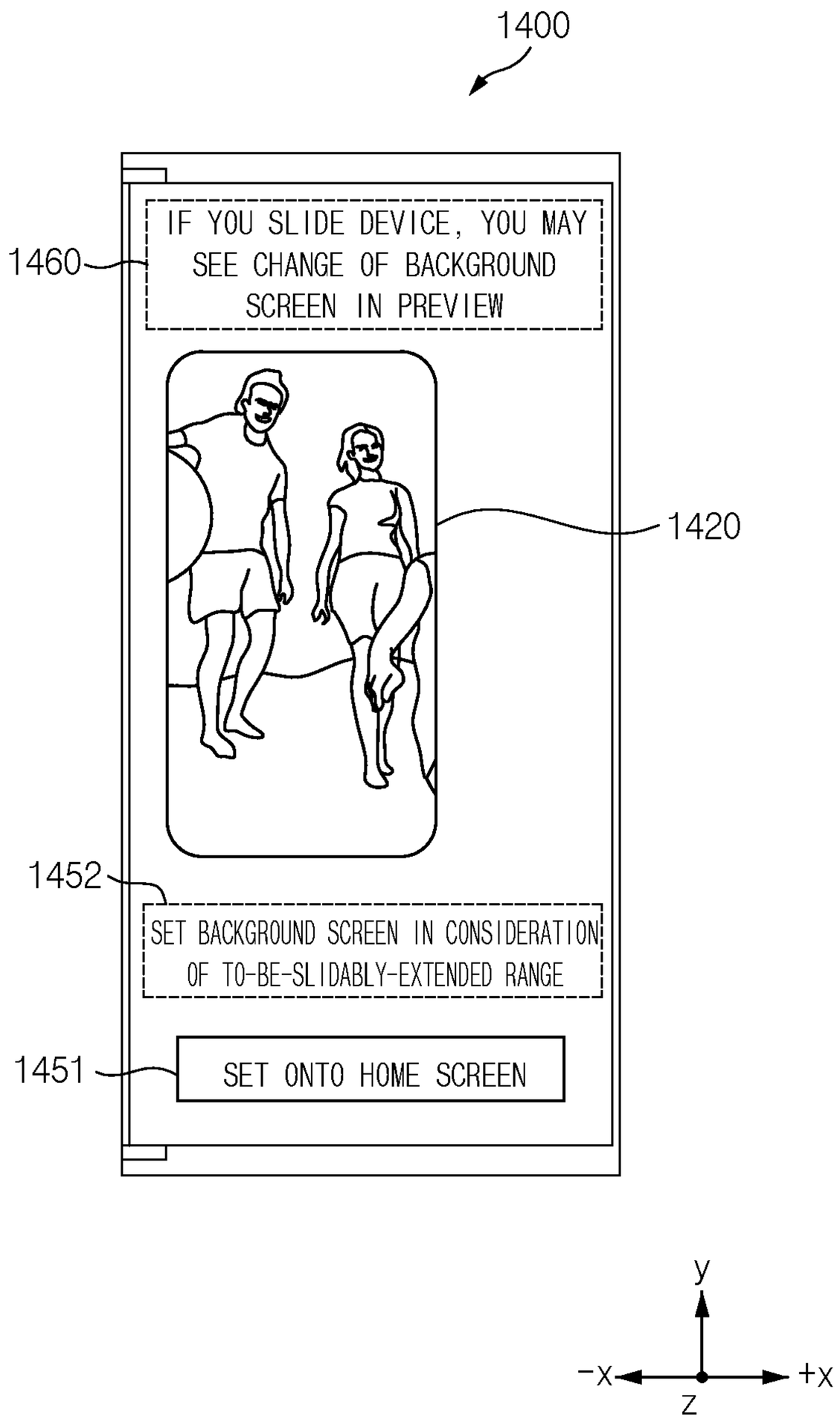

1400
1460
IF YOU SLIDE DEVICE, YOU MAY SEE CHANGE OF BACKGROUND SCREEN IN PREVIEW
1420
1452
SET BACKGROUND SCREEN IN CONSIDERATION OF TO-BE-SLIDABLY-EXTENDED RANGE
1451
SET ONTO HOME SCREEN
y
-x
+x
z

FIG.14

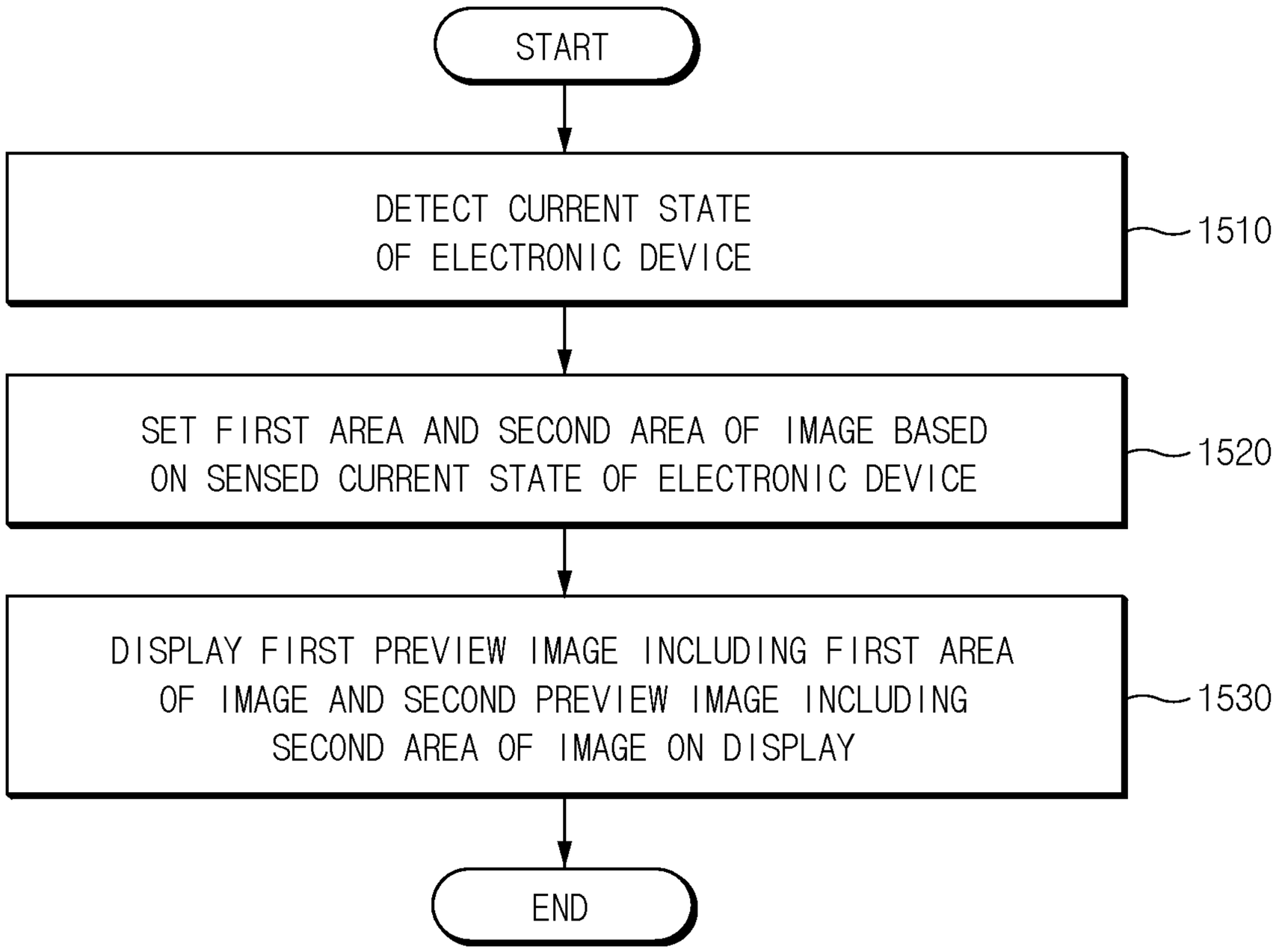

START
DETECT CURRENT STATE OF ELECTRONIC DEVICE
1510
SET FIRST AREA AND SECOND AREA OF IMAGE BASED ON SENSED CURRENT STATE OF ELECTRONIC DEVICE
1520
DISPLAY FIRST PREVIEW IMAGE INCLUDING FIRST AREA OF IMAGE AND SECOND PREVIEW IMAGE INCLUDING SECOND AREA OF IMAGE ON DISPLAY
1530
END

FIG.15

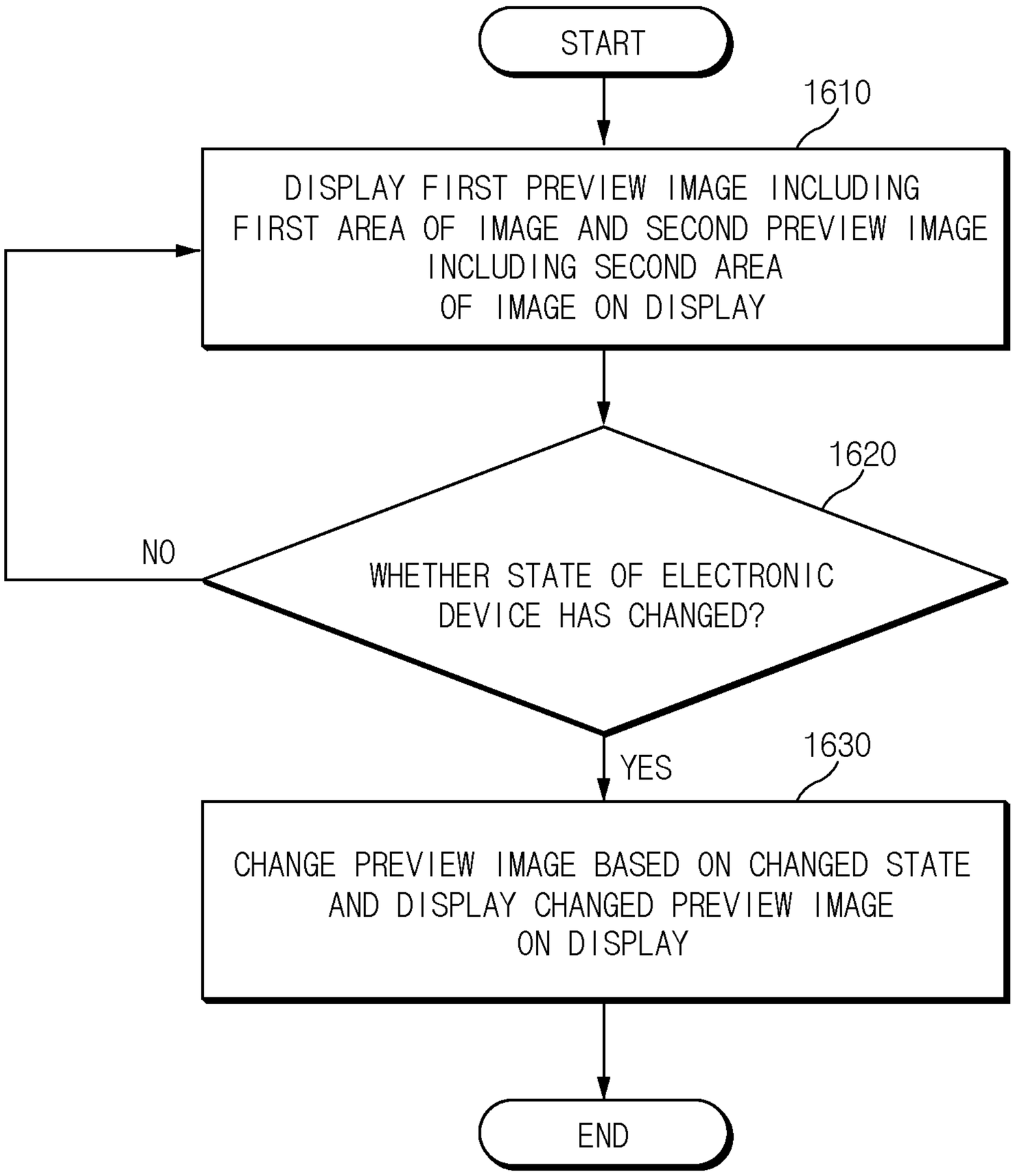

START
1610
DISPLAY FIRST PREVIEW IMAGE INCLUDING FIRST AREA OF IMAGE AND SECOND PREVIEW IMAGE INCLUDING SECOND AREA OF IMAGE ON DISPLAY
1620
WHETHER STATE OF ELECTRONIC DEVICE HAS CHANGED?
NO
YES
1630
CHANGE PREVIEW IMAGE BASED ON CHANGED STATE AND DISPLAY CHANGED PREVIEW IMAGE ON DISPLAY
END

FIG.16

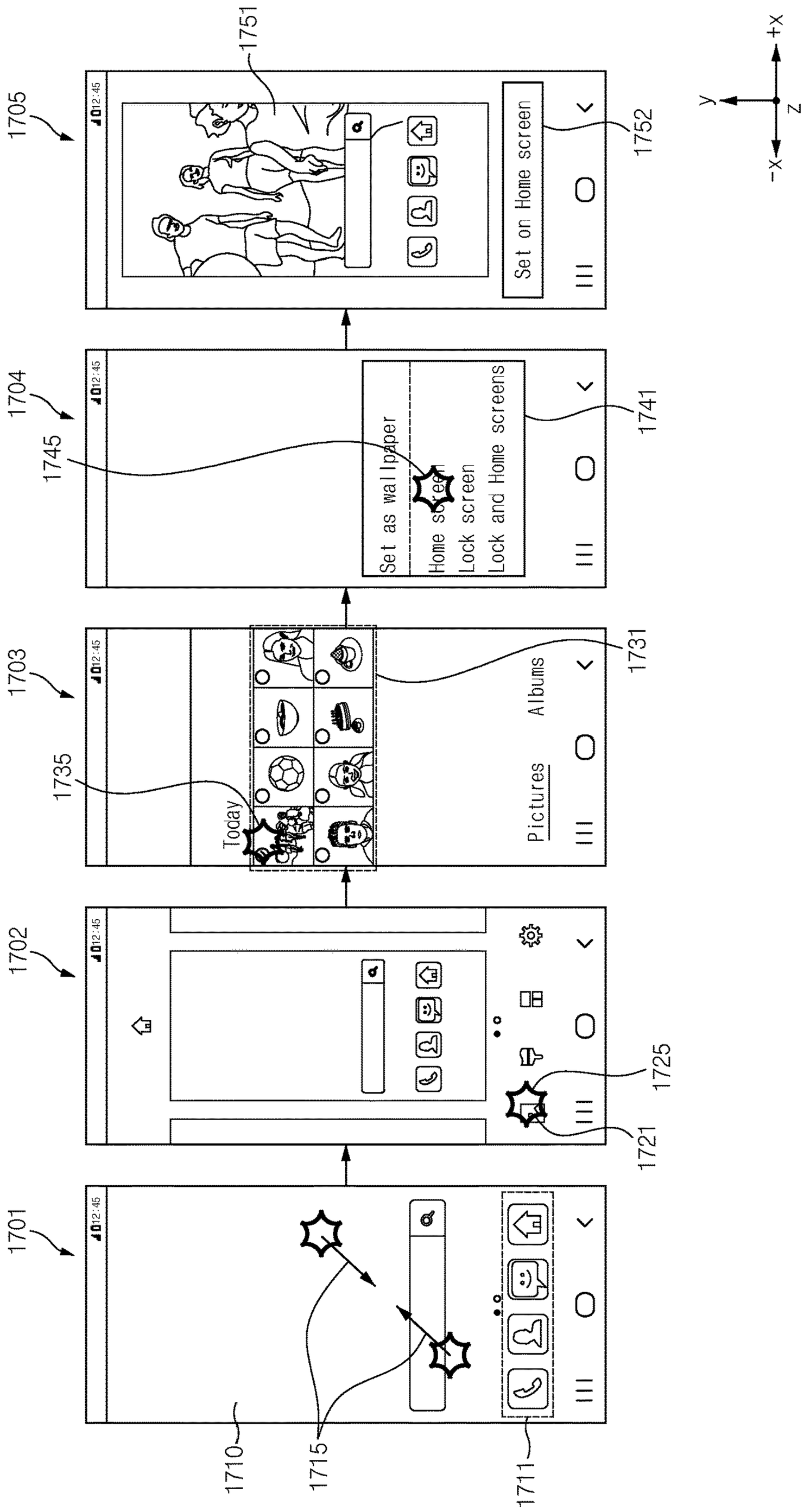

1705
1751
1752
Set on Home screen
1704
1745
1741
Set as wallpaper
Home screen
Lock screen
Lock and Home screens
1703
1735
1731
Today
Pictures
Albums
1702
1725
1721
1701
1710
1715
1711
+X
-X
y
z

FIG. 17

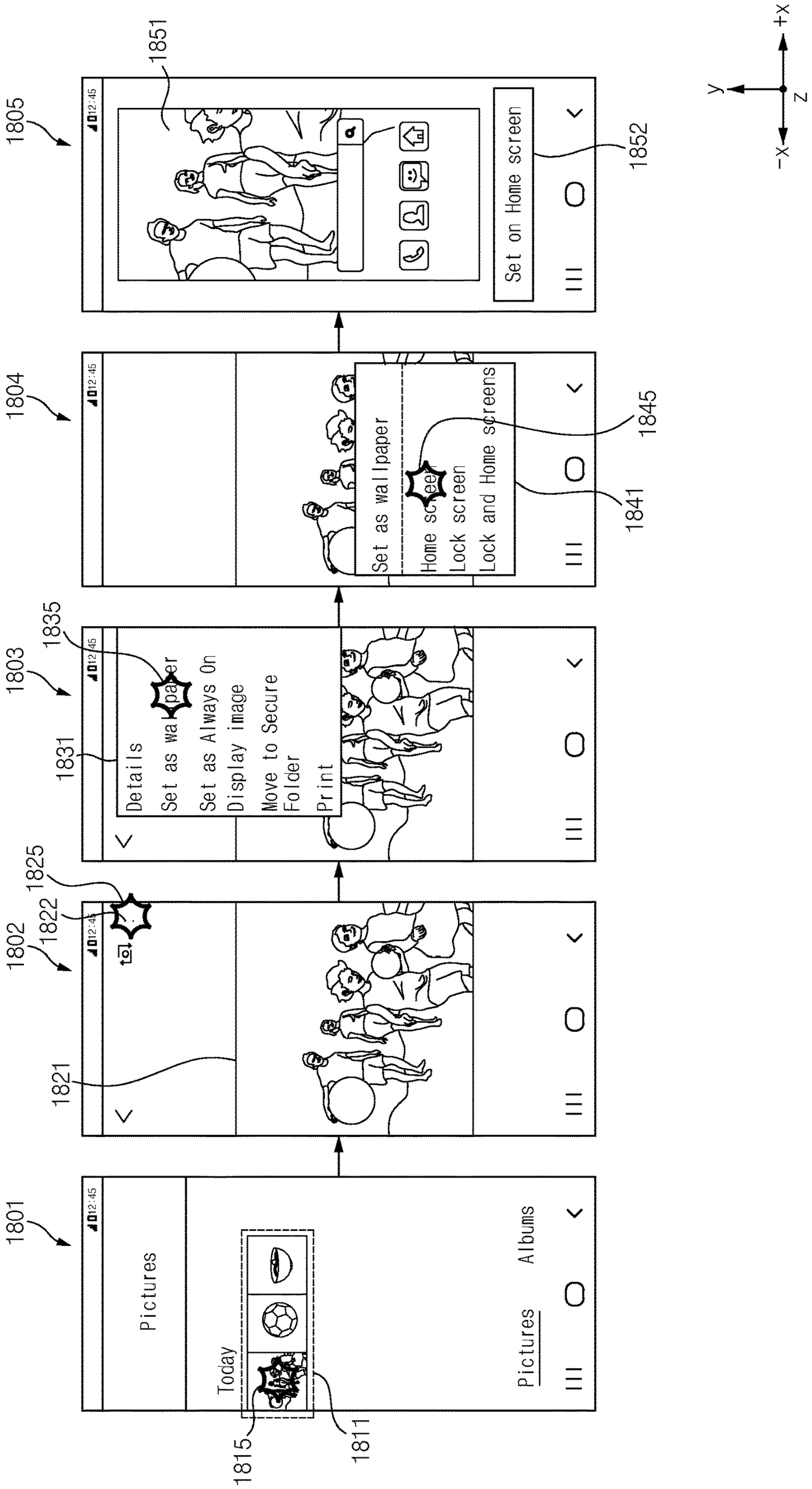

1801
1802
1803
1804
1805
1811
1815
1821
1822
1825
1831
1835
1841
1845
1851
1852
Pictures
Albums
Today
Details
Set as wallpaper
Set as Always On
Display image
Move to Secure
Folder
Print
Set as wallpaper
Home screen
Lock screen
Lock and Home screens
Set on Home screen
12:45
+x
-x
y
z

FIG. 18

ELECTRONIC DEVICE INCLUDING PREVIEW IMAGES FOR BACKGROUND SCREEN FOR FLEXIBLE DISPLAY AND CONTROL METHOD THEREOF

CROSS-REFERENCE TO RELATED APPLICATION(S)

This application is a continuation application, claiming priority under § 365(c), of an International application No. PCT/KR2021/013404, filed on Sep. 29, 2021, which is based on and claims the benefit of a Korean patent application number 10-2020-0148048, filed on Nov. 6, 2020, in the Korean Intellectual Property Office, and of a Korean patent application number 10-2021-0008252, filed on Jan. 20, 2021, in the Korean Intellectual Property Office, the disclosure of each of which is incorporated by reference herein in its entirety.

TECHNICAL FIELD

Embodiments disclosed in the disclosure may relate to an electronic device including a flexible display and a control method thereof.

BACKGROUND ART

An electronic device may display a screen through a display. The display included in the electronic device may be a flexible display. For example, the flexible display may be disposed on the electronic device and in a form in which at least one area thereof is curved, foldable, or rollable. Depending on a state of the electronic device, a size of a visually exposed display area of the display may decrease or increase.

The above information is presented as background information only to assist with an understanding of the disclosure. No determination has been made, and no assertion is made, as to whether any of the above might be applicable as prior art with regard to the disclosure.

DISCLOSURE

Technical Problem

Embodiments of the disclosure are to address at least the above-mentioned problems and/or disadvantages and to provide at least the advantages described below. Accordingly, embodiments of the disclosure are to provide an electronic device capable of displaying a background screen corresponding to an extended or retracted state of the display according to a change in a state of the electronic device.

Further, embodiments of the disclosure are to provide an intuitive and efficient background screen setting experience to a user in relation to a background screen that is displayed in a varying manner according to a state change of an electronic device in a background screen setting screen.

Additional embodiments will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the presented embodiments.

Technical Solution

According to an embodiment of the disclosure, an electronic device comprises: a display having a display area, wherein a size of the display area visually exposed in a first state of the electronic device is reduced and a size of the display area visually exposed in a second state of the electronic device is enlarged, and a processor operatively connected to the display, wherein the processor may be configured to acquire state information of the electronic device, successively display a first preview image and a second preview images on the display, based on the state information of the electronic device, wherein the first preview image includes a first area of a specified image and corresponds to a preview image of a background screen in the first state, wherein the second preview image includes a second area including the first area and a further area extending from the first area, and corresponds to a preview image of a background screen in the second state, and specify the image as a background screen, based on a first user input.

According to an embodiment of the disclosure, a method for controlling an electronic device including a flexible display having a display area according to one embodiment is proposed, wherein a size of the display area visually exposed in a first state of the electronic device is reduced, and a size of the display area visually exposed in a second state of the electronic device is enlarged. The method may comprise acquiring state information of the electronic device, successively displaying a first preview image and a second preview images on the display, based on the state information of the electronic device, wherein the first preview image includes a first area of a specified image and corresponds to a preview image of a background screen in the first state, wherein the second preview image includes a second area including the first area and a further area extending from the first area, and corresponds to a preview image of a background screen in the second state, and specifying the image as a background screen, based on a first user input.

Advantageous Effects

According to the embodiments, the electronic device may display the background screen corresponding to the extended or retracted state of the display according to the state change of the electronic device.

Further, according to embodiments, the electronic device may provide the intuitive and efficient background screen setting experience to the user in relation to the background screen that is displayed in a varying manner according to the state change of the electronic device in the background screen setting screen.

In addition, various effects directly or indirectly identified through the disclosure may be provided.

Other embodiments, advantages, and salient features of the disclosure will become apparent to those skilled in the art from the following detailed description, which, taken in conjunction with the annexed drawings, discloses various embodiments of the disclosure.

DESCRIPTION OF DRAWINGS

The above and other aspects, features, and advantages of certain embodiments of the disclosure will be more apparent from the following description taken in conjunction with the accompanying drawings, in which:

FIG. **1** is a block diagram of an electronic device in a network environment, according to an embodiment of the disclosure;

FIG. **2** is a block diagram of a display module according to an embodiment of the disclosure;

FIG. **3** is a block diagram illustrating a program according to an embodiment of the disclosure;

FIG. **4** is a diagram showing a first state of an electronic device according to an embodiment of the disclosure;

FIG. **5** is a diagram showing a second state of an electronic device according to an embodiment of the disclosure;

FIG. **6** is an exploded perspective view of an electronic device according to an embodiment of the disclosure;

FIG. **7** is a block diagram showing an electronic device according to an embodiment of the disclosure;

FIG. **8** is a diagram showing an electronic device that displays a preview image according to an embodiment of the disclosure;

FIG. **9** is a view showing a first area of an image included in a first preview image and a second area of an image included in a second preview image according to an embodiment of the disclosure;

FIG. **10** is a diagram showing an electronic device that displays a preview image according to an embodiment of the disclosure;

FIG. **11** is a view showing a first area of an image included in a first preview image and a second area of an image included in a second preview image according to an embodiment of the disclosure;

FIG. **12** is a view showing a preview image according to a state of the electronic device according to an embodiment of the disclosure;

FIG. **13** is a view showing a preview image according to a state of the electronic device according to an embodiment of the disclosure;

FIG. **14** is a diagram showing a background screen setting screen in an electronic device according to an embodiment of the disclosure;

FIG. **15** is a flowchart showing an operation configuration of an electronic device according to an embodiment of the disclosure;

FIG. **16** is a flowchart showing an operation configuration of an electronic device according to an embodiment of the disclosure;

FIG. **17** is a diagram showing that an electronic device executes a background screen setting application according to an embodiment of the disclosure; and

FIG. **18** is a diagram showing that an electronic device executes a background screen setting application according to an embodiment of the disclosure.

Throughout the drawings, it should be noted that same or similar reference numbers are used to depict the same or similar elements, features, and structures.

MODE FOR INVENTION

The following description with reference to the accompanying drawings is provided to assist in a comprehensive understanding of various embodiments of the disclosure as defined by the claims and their equivalents. It includes various specific details to assist in that understanding but these are to be regarded as merely exemplary. Accordingly, those of ordinary skill in the art will recognize that various changes and modifications of the various embodiments described herein can be made without departing from the scope and spirit of the disclosure. In addition, descriptions of well-known functions and constructions may be omitted for clarity and conciseness.

The terms and words used in the following description and claims are not limited to the bibliographical meanings, but, are merely used by the inventor to enable a clear and consistent understanding of the disclosure. Accordingly, it should be apparent to those skilled in the art that the following description of various embodiments of the disclosure is provided for illustration purpose only and not for the purpose of limiting the disclosure as defined by the appended claims and their equivalents.

It is to be understood that the singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to "a component surface" includes reference to one or more of such surfaces.

FIG. **1** is a block diagram illustrating an electronic device in a network environment according to an embodiment of the disclosure.

Referring to FIG. **1**, an electronic device **101** in a network environment **100** may communicate with an electronic device **102** via a first network **198** (e.g., a short-range wireless communication network), or at least one of an electronic device **104** or a server **108** via a second network **199** (e.g., a long-range wireless communication network). According to an embodiment, the electronic device **101** may communicate with the electronic device **104** via the server **108**. According to an embodiment, the electronic device **101** may include a processor **120**, memory **130**, an input module **150**, a sound output module **155**, a display module **160**, an audio module **170**, a sensor module **176**, an interface **177**, a connecting terminal **178**, a haptic module **179**, a camera module **180**, a power management module **188**, a battery **189**, a communication module **190**, a subscriber identification module (SIM) **196**, or an antenna module **197**. In some embodiments, at least one of the components (e.g., the connecting terminal **178**) may be omitted from the electronic device **101**, or one or more other components may be added in the electronic device **101**. In some embodiments, some of the components (e.g., the sensor module **176**, the camera module **180**, or the antenna module **197**) may be implemented as a single component (e.g., the display module **160**).

The processor **120** may execute, for example, software (e.g., a program **140**) to control at least one other component (e.g., a hardware or software component) of the electronic device **101** coupled with the processor **120**, and may perform various data processing or computation. According to one embodiment, as at least part of the data processing or computation, the processor **120** may store a command or data received from another component (e.g., the sensor module **176** or the communication module **190**) in volatile memory **132**, process the command or the data stored in the volatile memory **132**, and store resulting data in non-volatile memory **134**. According to an embodiment, the processor **120** may include a main processor **121** (e.g., a central processing unit (CPU) or an application processor (AP)), or an auxiliary processor **123** (e.g., a graphics processing unit (GPU), a neural processing unit (NPU), an image signal processor (ISP), a sensor hub processor, or a communication processor (CP)) that is operable independently from, or in conjunction with, the main processor **121**. For example, when the electronic device **101** includes the main processor **121** and the auxiliary processor **123**, the auxiliary processor **123** may be adapted to consume less power than the main processor **121**, or to be specific to a specified function. The auxiliary processor **123** may be implemented as separate from, or as part of the main processor **121**.

The auxiliary processor **123** may control at least some of functions or states related to at least one component (e.g., the display module **160**, the sensor module **176**, or the communication module **190**) among the components of the electronic device **101**, instead of the main processor **121** while

the main processor **121** is in an inactive (e.g., sleep) state, or together with the main processor **121** while the main processor **121** is in an active state (e.g., executing an application). According to an embodiment, the auxiliary processor **123** (e.g., an image signal processor or a communication processor) may be implemented as part of another component (e.g., the camera module **180** or the communication module **190**) functionally related to the auxiliary processor **123**. According to an embodiment, the auxiliary processor **123** (e.g., the neural processing unit) may include a hardware structure specified for artificial intelligence model processing. An artificial intelligence model may be generated by machine learning. Such learning may be performed, e.g., by the electronic device **101** where the artificial intelligence is performed or via a separate server (e.g., the server **108**). Learning algorithms may include, but are not limited to, e.g., supervised learning, unsupervised learning, semi-supervised learning, or reinforcement learning. The artificial intelligence model may include a plurality of artificial neural network layers. The artificial neural network may be a deep neural network (DNN), a convolutional neural network (CNN), a recurrent neural network (RNN), a restricted boltzmann machine (RBM), a deep belief network (DBN), a bidirectional recurrent deep neural network (BRDNN), deep Q-network or a combination of two or more thereof but is not limited thereto. The artificial intelligence model may, additionally or alternatively, include a software structure other than the hardware structure.

The memory **130** may store various data used by at least one component (e.g., the processor **120** or the sensor module **176**) of the electronic device **101**. The various data may include, for example, software (e.g., the program **140**) and input data or output data for a command related thereto. The memory **130** may include the volatile memory **132** or the non-volatile memory **134**.

The program **140** may be stored in the memory **130** as software, and may include, for example, an operating system (OS) **142**, middleware **144**, or an application **146**.

The input module **150** may receive a command or data to be used by another component (e.g., the processor **120**) of the electronic device **101**, from the outside (e.g., a user) of the electronic device **101**. The input module **150** may include, for example, a microphone, a mouse, a keyboard, a key (e.g., a button), or a digital pen (e.g., a stylus pen).

The sound output module **155** may output sound signals to the outside of the electronic device **101**. The sound output module **155** may include, for example, a speaker or a receiver. The speaker may be used for general purposes, such as playing multimedia or playing record. The receiver may be used for receiving incoming calls. According to an embodiment, the receiver may be implemented as separate from, or as part of the speaker.

The display module **160** may visually provide information to the outside (e.g., a user) of the electronic device **101**. The display module **160** may include, for example, a display, a hologram device, or a projector and control circuitry to control a corresponding one of the display, hologram device, and projector. According to an embodiment, the display module **160** may include a touch sensor adapted to detect a touch, or a pressure sensor adapted to measure the intensity of force incurred by the touch.

The audio module **170** may convert a sound into an electrical signal and vice versa. According to an embodiment, the audio module **170** may obtain the sound via the input module **150**, or output the sound via the sound output module **155** or a headphone of an external electronic device (e.g., an electronic device **102**) directly (e.g., wiredly) or wirelessly coupled with the electronic device **101**.

The sensor module **176** may detect an operational state (e.g., power or temperature) of the electronic device **101** or an environmental state (e.g., a state of a user) external to the electronic device **101**, and then generate an electrical signal or data value corresponding to the detected state. According to an embodiment, the sensor module **176** may include, for example, a gesture sensor, a gyro sensor, an atmospheric pressure sensor, a magnetic sensor, an acceleration sensor, a grip sensor, a proximity sensor, a color sensor, an infrared (IR) sensor, a biometric sensor, a temperature sensor, a humidity sensor, or an illuminance sensor.

The interface **177** may support one or more specified protocols to be used for the electronic device **101** to be coupled with the external electronic device (e.g., the electronic device **102**) directly (e.g., wiredly) or wirelessly. According to an embodiment, the interface **177** may include, for example, a high definition multimedia interface (HDMI), a universal serial bus (USB) interface, a secure digital (SD) card interface, or an audio interface.

A connecting terminal **178** may include a connector via which the electronic device **101** may be physically connected with the external electronic device (e.g., the electronic device **102**). According to an embodiment, the connecting terminal **178** may include, for example, a HDMI connector, a USB connector, a SD card connector, or an audio connector (e.g., a headphone connector).

The haptic module **179** may convert an electrical signal into a mechanical stimulus (e.g., a vibration or a movement) or electrical stimulus which may be recognized by a user via his tactile sensation or kinesthetic sensation. According to an embodiment, the haptic module **179** may include, for example, a motor, a piezoelectric element, or an electric stimulator.

The camera module **180** may capture a still image or moving images. According to an embodiment, the camera module **180** may include one or more lenses, image sensors, image signal processors, or flashes.

The power management module **188** may manage power supplied to the electronic device **101**. According to one embodiment, the power management module **188** may be implemented as at least part of, for example, a power management integrated circuit (PMIC).

The battery **189** may supply power to at least one component of the electronic device **101**. According to an embodiment, the battery **189** may include, for example, a primary cell which is not rechargeable, a secondary cell which is rechargeable, or a fuel cell.

The communication module **190** may support establishing a direct (e.g., wired) communication channel or a wireless communication channel between the electronic device **101** and the external electronic device (e.g., the electronic device **102**, the electronic device **104**, or the server **108**) and performing communication via the established communication channel. The communication module **190** may include one or more communication processors that are operable independently from the processor **120** (e.g., the application processor (AP)) and supports a direct (e.g., wired) communication or a wireless communication. According to an embodiment, the communication module **190** may include a wireless communication module **192** (e.g., a cellular communication module, a short-range wireless communication module, or a global navigation satellite system (GNSS) communication module) or a wired communication module **194** (e.g., a local area network (LAN) communication module or a power line communication (PLC) module). A

corresponding one of these communication modules may communicate with the external electronic device via the first network **198** (e.g., a short-range communication network, such as Bluetooth™ wireless-fidelity (Wi-Fi) direct, or infrared data association (IrDA)) or the second network **199** (e.g., a long-range communication network, such as a legacy cellular network, a 5G network, a next-generation communication network, the Internet, or a computer network (e.g., LAN or wide area network (WAN)). These various types of communication modules may be implemented as a single component (e.g., a single chip), or may be implemented as multi components (e.g., multi chips) separate from each other. The wireless communication module **192** may identify and authenticate the electronic device **101** in a communication network, such as the first network **198** or the second network **199**, using subscriber information (e.g., international mobile subscriber identity (IMSI)) stored in the subscriber identification module **196**.

The wireless communication module **192** may support a 5G network, after a 4G network, and next-generation communication technology, e.g., new radio (NR) access technology. The NR access technology may support enhanced mobile broadband (eMBB), massive machine type communications (mMTC), or ultra-reliable and low-latency communications (URLLC). The wireless communication module **192** may support a high-frequency band (e.g., the millimeter (mm) Wave band) to achieve, e.g., a high data transmission rate. The wireless communication module **192** may support various technologies for securing performance on a high-frequency band, such as, e.g., beamforming, massive multiple-input and multiple-output (massive MIMO), full dimensional MIMO (FD-MIMO), array antenna, analog beam-forming, or large scale antenna. The wireless communication module **192** may support various requirements specified in the electronic device **101**, an external electronic device (e.g., the electronic device **104**), or a network system (e.g., the second network **199**). According to an embodiment, the wireless communication module **192** may support a peak data rate (e.g., 20 Gbps or more) for implementing eMBB, loss coverage (e.g., 164 dB or less) for implementing mMTC, or U-plane latency (e.g., 0.5 ms or less for each of downlink (DL) and uplink (UL), or a round trip of 1 ms or less) for implementing URLLC.

The antenna module **197** may transmit or receive a signal or power to or from the outside (e.g., the external electronic device) of the electronic device **101**. According to an embodiment, the antenna module **197** may include an antenna including a radiating element composed of a conductive material or a conductive pattern formed in or on a substrate (e.g., a printed circuit board (PCB)). According to an embodiment, the antenna module **197** may include a plurality of antennas (e.g., array antennas). In such a case, at least one antenna appropriate for a communication scheme used in the communication network, such as the first network **198** or the second network **199**, may be selected, for example, by the communication module **190** (e.g., the wireless communication module **192**) from the plurality of antennas. The signal or the power may then be transmitted or received between the communication module **190** and the external electronic device via the selected at least one antenna. According to an embodiment, another component (e.g., a radio frequency integrated circuit (RFIC)) other than the radiating element may be additionally formed as part of the antenna module **197**.

According to various embodiments, the antenna module **197** may form a mmWave antenna module. According to an embodiment, the mmWave antenna module may include a printed circuit board, a RFIC disposed on a first surface (e.g., the bottom surface) of the printed circuit board, or adjacent to the first surface and capable of supporting a designated high-frequency band (e.g., the mmWave band), and a plurality of antennas (e.g., array antennas) disposed on a second surface (e.g., the top or a side surface) of the printed circuit board, or adjacent to the second surface and capable of transmitting or receiving signals of the designated high-frequency band.

At least some of the above-described components may be coupled mutually and communicate signals (e.g., commands or data) therebetween via an inter-peripheral communication scheme (e.g., a bus, general purpose input and output (GPIO), serial peripheral interface (SPI), or mobile industry processor interface (MIPI)).

According to an embodiment, commands or data may be transmitted or received between the electronic device **101** and the external electronic device **104** via the server **108** coupled with the second network **199**. Each of the electronic devices **102** or **104** may be a device of a same type as, or a different type, from the electronic device **101**. According to an embodiment, all or some of operations to be executed at the electronic device **101** may be executed at one or more of the external electronic devices **102** **104**, or **108**. For example, if the electronic device **101** should perform a function or a service automatically, or in response to a request from a user or another device, the electronic device **101**, instead of, or in addition to, executing the function or the service, may request the one or more external electronic devices to perform at least part of the function or the service. The one or more external electronic devices receiving the request may perform the at least part of the function or the service requested, or an additional function or an additional service related to the request, and transfer an outcome of the performing to the electronic device **101**. The electronic device **101** may provide the outcome, with or without further processing of the outcome, as at least part of a reply to the request. To that end, a cloud computing, distributed computing, mobile edge computing (MEC), or client-server computing technology may be used, for example. The electronic device **101** may provide ultra low-latency services using, e.g., distributed computing or mobile edge computing. In another embodiment, the external electronic device **104** may include an internet-of-things (IoT) device. The server **108** may be an intelligent server using machine learning and/or a neural network. According to an embodiment, the external electronic device **104** or the server **108** may be included in the second network **199**. The electronic device **101** may be applied to intelligent services (e.g., smart home, smart city, smart car, or healthcare) based on 5G communication technology or IoT-related technology.

FIG. **2** is a block diagram illustrating a display module according to an embodiment of the disclosure.

Referring to FIG. **2**, in a block diagram **200**, the display module **160** may include a display **210** and a display driver integrated circuit (DDI) **230** to control the display **210**. The DDI **230** may include an interface module **231**, memory **233** (e.g., buffer memory), an image processing module **235**, or a mapping module **237**. The DDI **230** may receive image information that contains image data or an image control signal corresponding to a command to control the image data from another component of the electronic device **101** via the interface module **231**. For example, according to an embodiment, the image information may be received from the processor **120** (e.g., the main processor **121** (e.g., an application processor)) or the auxiliary processor **123** (e.g., a graphics processing unit) operated independently from the

function of the main processor **121**. The DDI **230** may communicate, for example, with touch circuitry **150** or the sensor module **176** via the interface module **231**. The DDI **230** may also store at least part of the received image information in the memory **233**, for example, on a frame by frame basis. The image processing module **235** may perform pre-processing or post-processing (e.g., adjustment of resolution, brightness, or size) with respect to at least part of the image data. According to an embodiment, the pre-processing or post-processing may be performed, for example, based at least in part on one or more characteristics of the image data or one or more characteristics of the display **210**. The mapping module **237** may generate a voltage value or a current value corresponding to the image data pre-processed or post-processed by the image processing module **235**. According to an embodiment, the generating of the voltage value or current value may be performed, for example, based at least in part on one or more attributes of the pixels (e.g., an array, such as an RGB stripe or a pentile structure, of the pixels, or the size of each subpixel). At least some pixels of the display **210** may be driven, for example, based at least in part on the voltage value or the current value such that visual information (e.g., a text, an image, or an icon) corresponding to the image data may be displayed via the display **210**.

According to an embodiment, the display module **160** may further include the touch circuitry **250**. The touch circuitry **250** may include a touch sensor **251** and a touch sensor IC **253** to control the touch sensor **251**. The touch sensor IC **253** may control the touch sensor **251** to sense a touch input or a hovering input with respect to a certain position on the display **210**. To achieve this, for example, the touch sensor **251** may detect (e.g., measure) a change in a signal (e.g., a voltage, a quantity of light, a resistance, or a quantity of one or more electric charges) corresponding to the certain position on the display **210**. The touch circuitry **250** may provide input information (e.g., a position, an area, a pressure, or a time) indicative of the touch input or the hovering input detected via the touch sensor **251** to the processor **120**. According to an embodiment, at least part (e.g., the touch sensor IC **253**) of the touch circuitry **250** may be formed as part of the display **210** or the DDI **230**, or as part of another component (e.g., the auxiliary processor **123**) disposed outside the display module **160**.

According to an embodiment, the display module **160** may further include at least one sensor (e.g., a fingerprint sensor, an iris sensor, a pressure sensor, or an illuminance sensor) of the sensor module **176** or a control circuit for the at least one sensor. In such a case, the at least one sensor or the control circuit for the at least one sensor may be embedded in one portion of a component (e.g., the display **210**, the DDI **230**, or the touch circuitry **250**) of the display module **160**. For example, when the sensor module **176** embedded in the display module **160** includes a biometric sensor (e.g., a fingerprint sensor), the biometric sensor may obtain biometric information (e.g., a fingerprint image) corresponding to a touch input received via a portion of the display **210**. As another example, when the sensor module **176** embedded in the display module **160** includes a pressure sensor, the pressure sensor may obtain pressure information corresponding to a touch input received via a partial or whole area of the display **210**. According to an embodiment, the touch sensor **251** or the sensor module **176** may be disposed between pixels in a pixel layer of the display **210**, or over or under the pixel layer.

FIG. **3** is a block diagram illustrating the program according to an embodiment of the disclosure.

Referring to FIG. **3**, according to an embodiment, the program **140** may include an operating system (OS) **142** to control one or more resources of the electronic device **101**, middleware **144**, or an application **146** executable in the OS **142**. The OS **142** may include, for example, Android™, iOS™, Windows™, Symbian™, Tizen™, or Bada™. At least part of the program **140**, for example, may be pre-loaded on the electronic device **101** during manufacture, or may be downloaded from or updated by an external electronic device (e.g., the electronic device **102** or **104**, or the server **108**) during use by a user.

The OS **142** may control management (e.g., allocating or deallocation) of one or more system resources (e.g., process, memory, or power source) of the electronic device **101**. The OS **142**, additionally or alternatively, may include one or more driver programs to drive other hardware devices of the electronic device **101**, for example, the input module **150**, the sound output module **155**, the display module **160**, the audio module **170**, the sensor module **176**, the interface **177**, the haptic module **179**, the camera module **180**, the power management module **188**, the battery **189**, the communication module **190**, the subscriber identification module **196**, or the antenna module **197**.

The middleware **144** may provide various functions to the application **146** such that a function or information provided from one or more resources of the electronic device **101** may be used by the application **146**. The middleware **144** may include, for example, an application manager **301**, a window manager **303**, a multimedia manager **305**, a resource manager **307**, a power manager **309**, a database manager **311**, a package manager **313**, a connectivity manager **315**, a notification manager **317**, a location manager **319**, a graphic manager **321**, a security manager **323**, a telephony manager **325**, or a voice recognition manager **327**.

The application manager **301**, for example, may manage the life cycle of the application **146**. The window manager **303**, for example, may manage one or more graphical user interface (GUI) resources that are used on a screen. The multimedia manager **305**, for example, may identify one or more formats to be used to play media files, and may encode or decode a corresponding one of the media files using a codec appropriate for a corresponding format selected from the one or more formats. The resource manager **307**, for example, may manage the source code of the application **146** or a memory space of the memory **130**. The power manager **309**, for example, may manage the capacity, temperature, or power of the battery **189**, and determine or provide related information to be used for the operation of the electronic device **101** based at least in part on corresponding information of the capacity, temperature, or power of the battery **189**. According to an embodiment, the power manager **309** may interwork with a basic input/output system (BIOS) (not shown) of the electronic device **101**.

The database manager **311**, for example, may generate, search, or change a database to be used by the application **146**. The package manager **313**, for example, may manage installation or update of an application that is distributed in the form of a package file. The connectivity manager **315**, for example, may manage a wireless connection or a direct connection between the electronic device **101** and the external electronic device. The notification manager **317**, for example, may provide a function to notify a user of an occurrence of a specified event (e.g., an incoming call, message, or alert). The location manager **319**, for example, may manage locational information on the electronic device **101**. The graphic manager **321**, for example, may manage

one or more graphic effects to be offered to a user or a user interface related to the one or more graphic effects.

The security manager **323**, for example, may provide system security or user authentication. The telephony manager **325**, for example, may manage a voice call function or a video call function provided by the electronic device **101**. The voice recognition manager **327**, for example, may transmit a user's voice data to the server **108**, and receive, from the server **108**, a command corresponding to a function to be executed on the electronic device **101** based at least in part on the voice data, or text data converted based at least in part on the voice data. According to an embodiment, the middleware **144** may dynamically delete some existing components or add new components. According to an embodiment, at least part of the middleware **144** may be included as part of the OS **142** or may be implemented as another software separate from the OS **142**.

The application **146** may include, for example, a home **351**, dialer **353**, short message service (SMS)/multimedia messaging service (MMS) **355**, instant message (IM) **357**, browser **359**, camera **361**, alarm **363**, contact **365**, voice recognition **367**, email **369**, calendar **371**, media player **373**, album **375**, watch **377**, health **379** (e.g., for measuring the degree of workout or biometric information, such as blood sugar), or environmental information **381** (e.g., for measuring air pressure, humidity, or temperature information) application. According to an embodiment, the application **146** may further include an information exchanging application (not shown) that is capable of supporting information exchange between the electronic device **101** and the external electronic device. The information exchange application, for example, may include a notification relay application adapted to transfer designated information (e.g., a call, message, or alert) to the external electronic device or a device management application adapted to manage the external electronic device. The notification relay application may transfer notification information corresponding to an occurrence of a specified event (e.g., receipt of an email) at another application (e.g., the email application **369**) of the electronic device **101** to the external electronic device. Additionally or alternatively, the notification relay application may receive notification information from the external electronic device and provide the notification information to a user of the electronic device **101**.

The device management application may control the power (e.g., turn-on or turn-off) or the function (e.g., adjustment of brightness, resolution, or focus) of the external electronic device or some component thereof (e.g., a display device or a camera module of the external electronic device). The device management application, additionally or alternatively, may support installation, delete, or update of an application running on the external electronic device.

FIG. **4** is a diagram showing a first state of an electronic device according to an embodiment of the disclosure.

FIG. **5** is a diagram showing a second state of an electronic device according to an embodiment of the disclosure.

Referring to FIGS. **4** and **5**, an electronic device **400** (e.g., the electronic device **101** in FIG. **1**) according to one embodiment may include a housing and a display **450**. The housing may include a first structure **410** and a second structure **440**.

In one embodiment, the electronic device **400** may be of a slidable type or a rollable type. The electronic device **400** may include the first state (e.g., a closed state or a retracted state) and the second state (e.g., an opened state or an extended state). The first state and the second state may be determined based on a relative position of the second structure **440** with respect to the first structure **410**. The electronic device **400** may be deformable into between the first state and the second state via a user's manipulation or a mechanical operation.

In one embodiment, the first state may refer to a state in which an area (or a size) of the display **450** visually exposed in a frontward direction of the electronic device **400** is relatively reduced. The second state may refer to a state in which the area (or the size) of the display **450** exposed in a frontward direction of the electronic device **400** is relatively enlarged. For example, the second state may be a state in which the area of the display **450** visually exposed in a frontward direction of the electronic device **400** is larger than that in the first state. Further, in the first state, a portion (e.g., side portions **443** and **444** respectively facing in +y/−y axis directions) of the second structure **440** may be located inwardly (or outwardly) of the first structure **410**, such that the second structure **440** may be in a closed state with respect to the first structure **410**. In the second state, the portions **443** and **444** of the second structure **440** exit from the first structure **410** such that the second structure **440** may be in an opened state with respect to the first structure **410**. In one embodiment, the electronic device **400** may further include a third state (hereinafter, also referred to as an intermediate state) between the first state and the second state. For example, the intermediate state may have a larger area of the display **450** that is visually exposed in a frontward direction of the electronic device **400** compared to that in the first state, and a smaller area of the display **450** that is visually exposed in a frontward direction of the electronic device **400** compared to that in the second state.

In one embodiment, the first structure **410** and the second structure **440** may be coupled to each other such that the first structure **410** and the second structure **440** slides relative to each other. The second structure **440** may be slidably coupled to one side of the first structure **410**. For example, the first structure **410** may be a fixed structure, and the second structure **440** may be a structure that is relatively movable with respect to the first structure **410**. The second structure **440** may be coupled to one side of the first structure **410** so as to be slidable in both directions (e.g., +x/−x axis directions) with respect to the first structure **410**.

In another embodiment, a long side surface (e.g., a surface extending in the y-axis direction) of the second structure **440** may slide in both directions (e.g., the +y/−y-axis directions). In still another embodiment, the electronic device **400** includes a plurality of second structures **440**. One second structure may slide in one direction (e.g., +x-axis direction or +y-axis direction), and the other second structure may slide in the opposite direction (e.g., −x-axis direction or −y-axis direction).

In one embodiment, the electronic device **400** may be deformed into the first state and the second state as the second structure **440** slides with respect to the first structure **410**. For example, in the electronic device **400**, the second structure **440** may move in a second direction DR**2** with respect to the first structure **410** in the first state (e.g., the state of FIG. **4**) such that the electronic device **400** may be deformed into the second state (e.g., the state of FIG. **5**). Conversely, the second structure **440** may move in a first direction DR**1** with respect to the first structure **410** in the second state such that the electronic device **400** may be deformed into the first state.

In one embodiment, the display **450** may change the size (or the area) of the area thereof exposed in a frontward direction of the electronic device **400** in response to the sliding operation of the second structure **440**. While the

display **450** is supported on at least one of the first structure **410** or the second structure **440**, a size of the exposed area thereof may increase or decrease according to the sliding operation of the second structure **440**. The display **450** may include at least a partially flexible part.

In one embodiment, the display **450** may include a basic area AA**1** and an extended area AA**2** extending from the basic area AA**1**. The basic area AA**1** may be maintained at a state exposed in a frontward direction of the electronic device **400**. The extended area AA**2** may have a variable size of an area exposed in a frontward direction of the electronic device **400** according to the state of the electronic device **400**. The extended area AA**2** may extend from one side of the basic area AA**1**. For example, the basic area AA**1** may mean a partial area of the display **450** visually exposed in a frontward direction of the electronic device **400** in the first state. The extended area AA**2** may be refer to an area which is located inside the electronic device **400** in the first state, and whose at least a portion extends out of the electronic device **400** and is visually exposed in a frontward direction of the electronic device **400** in the second state.

In one embodiment, in the first state, the basic area AA**1** may be located across a front surface of the electronic device **400**, and the extended area AA**2** may be located inside the first structure **410**. The second state may refer to a state in which at least a portion of the extended area AA**2** together with the basic area AA**1** are located across the front surface of the electronic device **400**. In the electronic device **400**, the extended area AA**2** is additionally exposed in a frontward direction of the electronic device **400** in the second state, so that a size of the exposed area of the display **450** may increase. The display **450** may include a display area which is visually exposed in a frontward direction of the electronic device **400** and in which predetermined visual information (or screen) is displayed. For example, in the first state, the display area may correspond to the basic area AA**1**. In the second state, the display area may correspond to a sum of a portion of the extended area AA**2** and the basic area AA**1**. In the second state, the electronic device **400** may provide an extended display area larger than that in the first state as the screen may be displayed on the portion of the extended area AA**2** together with the basic area AA**1** in the second state.

In one embodiment, the electronic device **400** may be manually switched to the first state and/or the second state by the user or a driving mechanism (e.g., a drive motor, a reduction gear module and/or a gear assembly) disposed inside the first structure **410** or the second structure **440**. According to one embodiment, an operation of the driving mechanism may be triggered based on user input. According to one embodiment, the user input for triggering the operation of the driving mechanism may include a touch input, a force touch input, and/or a gesture input on the display **450**. In another embodiment, the user input for triggering the operation of the driving mechanism may include a voice input, or an input to a physical button disposed on an outer face of the first structure **410** and/or the second structure **440** and exposed outwardly.

FIG. **6** is an exploded perspective view of an electronic device according to an embodiment of the disclosure.

Referring to FIG. **6**, an electronic device **600** according to one embodiment may include a housing composed of a first structure **610** and a second structure **640**, a display **650**, a first roller **691**, a second roller **692**, a tension belt **693**, and a circuit board **694**.

In one embodiment, the first structure **610** may include a casing **620** and a bracket **630**. The bracket **630** may be coupled to the casing **620**, and at least a portion thereof may be surrounded with the casing **620**. For example, the bracket **630** may be fixed to the casing **620**. The casing **620** and the bracket **630** may be movable relative to the second structure **640** in response to a sliding operation of the second structure **640**. The casing **620** and the bracket **630** may act as a reference for sliding movement of the second structure **640** and the display **650**.

In one embodiment, the casing **620** may define at least a portion of an outer surface of the electronic device **600**. The casing **620** may include a first side member **621**, a second side member **622**, and a rear member **623**. The first side member **621** and the second side member **622** may face toward each other in a direction substantially perpendicular to a sliding direction (e.g., the first direction DR**1** and the second direction DR**2**) of the second structure **640**. The rear member **623** may be disposed between the first side member **621** and the second side member **622**, and may be connected to each of the first side member **621** and the second side member **622**. The first side member **621**, the second side member **622**, and the rear member **623** may be coupled to each other to define a space in which at least some of other components (e.g., the bracket **630**, the second structure **640**, and the circuit board **694**) of the electronic device **600** may be disposed.

In one embodiment, the rear member **623** may include a frame **624** and a cover **625**. For example, the frame **624** may be coupled to the bracket **630**. The cover **625** may be coupled to the frame **624** to form at least a portion of the rear surface of the electronic device **600**. A space in which the second structure **640** and the extended area AA**2** of the display **650** are accommodated may be located between the cover **625** and the bracket **630**.

According to the illustrated embodiment, the first side member **621**, the second side member **622**, the frame **624** and/or the rear cover **625** may be formed as separate components, and may be assembled with each other or may be combined with each other. However, the disclosure is not limited thereto. According to various embodiments of the disclosure, the first side member **621**, the second side member **622**, the frame **624** and the rear cover **625** are integrally formed with each other to constitute one part.

In one embodiment, the bracket **630** may be disposed to at least partially overlap the second structure **640**. A first surface **631** (e.g., a surface facing in the +z-axis direction or a top surface based on FIG. **6**) of the bracket **630** may face toward the plate portion **641** of the second structure **640**. A second surface **632** (e.g., a surface facing in the −z-axis direction or a bottom surface based on FIG. **6**) of the bracket **630** may face toward the circuit board **694**. The circuit board **694** may be disposed on the second surface **632** of the bracket **630**.

In one embodiment, the second structure **640** may be disposed to surround at least a portion of the bracket **630**. The second structure **640** may include the plate portion **641** supporting a portion of the basic area AA**1** of the display **650** and a multi-joint member **642** that supports another portion of the basic area AA**1** and a portion of the extended area AA**2** of the flexible display (i.e., display **650**). For example, the multi-joint member **642** may extend from the plate portion **641**, and may be bendable. The multi joint member **642** may be at least partially curved in response to the sliding operation of the second structure **640**.

In one embodiment, the multi joint member **642** may be coupled to the first roller **691**. The multi joint member **642** may include a plurality of bars extending in a direction substantially parallel to a rolling axis R of the first roller **691**. For example, the multi joint member **642** may include a

flexible track or a hinge rail. According to one embodiment, the plate portion **641** may be configured to slide in the first direction DR**1** or the second direction DR**2**. The multi joint member **642** may be configured such that a portion thereof rotates via the first roller **691** and the other portion thereof slides in the first direction DR**1** or the second direction DR**2**.

In one embodiment, the first roller **691** may be disposed on one side surface of the bracket **630**. The first roller **691** may be rotatably coupled to the bracket **630**. For example, the first roller **691** may rotate in both directions about the rolling axis R according to the sliding operation of the second structure **640**. The first roller **691** may contact a portion of the multi joint member **642** of the second structure **640**. For example, the second structure **640** may be disposed such that the multi joint member **642** surrounds at least a portion of the first roller **691**. The first roller **691** may be configured to rotate a portion of the multi joint member **642**. The first roller **691** may contact an area of the multi joint member **642** varying according to the state change of the electronic device **600**.

In one embodiment, the second structure **640** may be slidably coupled to the bracket **630** via the tension belt **693** and the second roller **692**. The tension belt **693** may connect an end of the plate portion **641** of the second structure **640** and an end of the multi-joint member **642** to each other. The second roller **692** may be configured to rotate in the same direction as a rotation direction of the first roller **691** according to the sliding operation of the second structure **640**. For example, the tension belt **693** may be configured to provide tension to the multi joint member **642** while being disposed between the plate portion **641** and the multi joint member **642**. According to one embodiment, when the plate portion **641** moves in the first direction DR**1**, one end of the tension belt **693** connected to the plate portion **641** may move in the first direction DR**1**, while the opposite end of the tension belt **693** connected to the multi-joint member **642** may move in the second direction DR**2**. Conversely, when the plate portion **641** moves in the second direction DR**2**, one end of the tension belt **693** may move in the second direction DR**2**, while the opposite end of the tension belt **693** may move in the first direction DR**1**. However, the illustrated embodiment is illustrative. According to various embodiments, the electronic device **600** may not include at least one of the second roller **692** or the tension belt **693**.

In one embodiment, the display **650** may be disposed on the second structure **640**. For example, the display **650** may be coupled to the second structure **640** such that the display **650** together with the second structure **640** perform sliding movement with respect to the first structure **610**. The display **650** may include the basic area AA**1** and the extended area AA**2** extending from the basic area AA**1**. For example, the basic area AA**1** may mean an area visually exposed in a frontward direction of the electronic device **600** in the first state. The extended area AA**2** may refer to an area which may be located inside the electronic device **600** in the first state, and whose at least a portion moves out of the electronic device **600** and thus is visually exposed in a frontward direction of the electronic device **600** in the second state.

The electronic device **600** according to an embodiment may be configured such that in the first state, the basic area AA**1** may be visually exposed in a frontward direction of the electronic device **600**, and in the second state, at least a portion of the extended area AA**2** together with the basic area AA**1** may be visually exposed in a frontward direction of the electronic device **600**. A position of the extended area AA**2** may vary as at least a portion thereof rotates together with the rotation of the first roller **691**. For example, as the second structure **640** moves in the first direction DR**1** with respect to the first structure **610**, the extended area AA**2** together with the basic area AA**1** may be disposed on the front surface of the electronic device **600**. Further, the extended area AA**2** may be accommodated in a space between the bracket **630** and the rear member **623** as the second structure **640** moves in the second direction DR**2** with respect to the first structure **610**.

In one embodiment, the circuit board **694** may be disposed in the first structure **610**. The circuit board **694** may be disposed between the bracket **630** and the rear member **623**. For example, the circuit board **694** may be disposed inside the electronic device **600** while being supported on the bracket **630**. The circuit board **694** may be coupled to at least a partial area of the second surface **632** of the bracket **630** and thus may be fixed to the first structure **610**. The circuit board **694** together with the first structure **610** may move relative to the second structure **640** during the sliding operation of the second structure **640**.

In one embodiment, the circuit board **694** may include a printed circuit board (PCB), a flexible PCB (FPCB), or a rigid-flexible PCB (RFPCB). Various electronic components included in the electronic device **600** may be electrically connected to the circuit board **694**. A processor (e.g., the processor **120** in FIG. **1**), a memory (e.g., the memory **130** in FIG. **1**) and/or an interface (e.g., the interface **177** in FIG. **1**) may be disposed in the circuit board **694**). For example, the processor may include a main the processor and/or an auxiliary processor. The main the processor and/or the auxiliary processor may include one or more of a central processing unit, an application the processor, a graphics processing unit, and an image signal processor, a sensor hub processor or a communication processor. For example, the memory may include a volatile memory or a non-volatile memory. For example, the interface may include a high definition multimedia interface (HDMI), a universal serial bus (USB) interface, an SD card interface, and/or an audio interface. Further, the interface may electrically or physically connect the electronic device **600** to an external electronic device, and may include a USB connector, an SD card/MMC connector, or an audio connector.

In one embodiment, a battery (e.g., the battery **189** in FIG. **1**) may supply power to at least one component of the electronic device **600**. The battery may be integrally disposed inside the electronic device **600** or may be disposed detachably from the electronic device **600**. According to various embodiments of the disclosure, the battery may be disposed inside the electronic device **600** while the battery together with the circuit board **694** are supported on the bracket **630**. The battery may be coupled to at least a partial area of the second surface **632** of the bracket **630**. The battery may be substantially coplanar with the circuit board **694**. The battery together with the first structure **610** may move relative to the second structure **640** during the sliding operation of the second structure **640**.

FIG. **7** is a block diagram showing an electronic device according to an embodiment of the disclosure.

Referring to FIG. **7**, an electronic device **700** according to one embodiment (e.g., the electronic device **101** in FIG. **1**) may include a display **710** (e.g., the display module **160** in FIG. **1**), a memory **730** (e.g., the memory **130** in FIG. **1**) and a processor **720** (e.g., the processor **120** in FIG. **1**).

At least a portion of the display **710** may include a flexible area. According to one embodiment, the display **710** may be configured to extend and retract. For example, the display **710** may include at least one of a slideable display, a foldable display, or a rollable display.

Depending on the state of the electronic device **700**, a size of the display area (or the exposed area) of the display **710** may increase or decrease. In the first state (e.g., the retracted state) of the electronic device **700**, the display area of the display **710** may retract, and in the second state (e.g., the extended state), the display area of the display **710** may extend. For example, in the first state of the electronic device **700**, at least a portion of the display **710** may be disposed in a rolled or bent state and within the electronic device **700**, and thus may not be visually exposed. In the second state of the electronic device **700**, the at least a portion of the display **710** may be unfolded and thus visually exposed.

According to one embodiment, the display **710** may extend or retract in an automatic, semi-automatic, or manual manner. For example, the display **710** may further receive a driving motor (not shown) therein. The automatic display **710** may automatically extend or retract using the driving motor based on a specified signal created by the processor **720**. For example, in the semi-automatic manner, the display **710** of the electronic device **700** may automatically extend based on an operation of the drive motor based on a specified signal created by the processor **720**. Then, the display **710** of the electronic device **700** may retract by a user directly applying a force to the display **710** of the electronic device **700** in the extended state. For example, in the manual manner, the display **710** of the electronic device **700** may extend or retract by a user directly applying a force to the display **710** of the electronic device **700**. The display as described with reference to the drawings to be described later may extend or retract in the above-described automatic, semi-automatic, or manual manner. In another example, the display **710** may extend based on an input applied to a pre-specified area. When an input provided from the user (e.g., an input based on a physical key, a touch input, a long press input, or an input of a specified pattern (e.g., knocks)) is applied to a predetermined area of the display **710** in the state in which the display **710** has retracted, the display **710** may automatically extend. In various embodiments, the display **710** may extend when an input provided from an external input device (not shown) (e.g., a stylus pen) is applied to a predetermined area in the state in which the display **710** has retracted.

The memory **730** may store therein at least one program, at least one application, data, or instructions executed by the processor **720**. According to one embodiment, the memory **730** may include at least a portion of the memory **130** shown in FIG. **1**. According to one embodiment, the memory **730** may store therein information or instructions for performing at least a portion of an operation of the electronic device **700** to be described later. According to one embodiment, the memory **730** may store therein instructions related to a plurality of applications executed by the processor **720**.

The processor **720** may detect the state of the electronic device **700** using a sensor (e.g., the sensor module **176** of FIG. **1**). For example, the sensor may be at least one of a magnetic sensor such as a hall sensor, a proximity sensor, an illuminance sensor, a touch sensor, a bending sensor, and an infrared sensor, or a combination thereof. For example, the processor **720** may identify a rolling state or a sliding state of the display **710**. The processor **720** may identify rolling in/out (or sliding in/out) and a rolling amount (or a sliding amount). According to an embodiment, the processor **720** may acquire state information about the state of the electronic device **700** from the sensor.

According to one embodiment, in order to detect the state of the electronic device **700**, the processor **720** may include another sensor for checking movement (rotation) of a magnetic body (e.g., in the x-axis, y-axis, and z-axis directions). For example, the electronic device **700** may include a TMR sensor (a tunnel magneto-resistance sensor) and thus may use a resistance value that changes based on relative angles between a plurality of magnetic units of the TMR sensor to check movement (rotation) of the magnetic body. Further, according to another embodiment, the electronic device **700** may check the movement (rotation) of the magnetic body using an anisotropic magneto-resistance (AMR) sensor or a giant magneto-resistance (GMR) sensor.

In one embodiment, the sensor may include at least one of an accelerometer, a gyro sensor (e.g., a gyroscope), and a geomagnetic sensor. Alternatively, the sensor may detect an inclination angle of the electronic device **700** with respect to a ground surface and/or a direction in which the electronic device **700** faces in a three-dimensional coordinate system, using sensed data acquired from at least one of the accelerometer, the gyro sensor or the geomagnetic sensor. However, the disclosure is not limited thereto. Various sensors capable of obtaining information about the inclination angle of the electronic device **700** may be used. For example, the accelerometer may sense information about linear motion of the electronic device **700** and/or acceleration of the electronic device **700** in three axes. The gyro sensor may sense information related to the rotation of the electronic device **700**, and the geomagnetic sensor may sense information about a direction in which the electronic device **700** faces in an absolute coordinate system.

According to one embodiment, the processor **720** may create a virtual coordinate space based on an azimuth (e.g., a yaw, pitch and/or roll value) as measured by a 9-axis motion sensor (e.g., the accelerometer, the gyro sensor, and the geomagnetic sensor). The processor **720** may define one area of the virtual coordinate space as a landscape range, and another area thereof as a portrait range. According to one embodiment, when a current state of the electronic device **700** is included in the landscape range, the processor **720** may determine that the electronic device **700** has a landscape orientation. For example, the landscape orientation of the electronic device **700** may represent a state in which parallel long sides of the electronic device **700** are parallel to a horizontal axis parallel to the ground. According to one embodiment, when the current state of the electronic device **700** is included in the portrait range, the processor **720** may determine that the electronic device **700** has a portrait orientation. For example, the portrait orientation of the electronic device **700** may represent a state in which the parallel long sides of the electronic device **700** are parallel to a vertical axis perpendicular to the ground.

The processor **720** may display a preview image for a background screen on the display **710** in response to execution of an application for setting the background screen. The processor **720** may display a preview image for a background screen using a selected image based on a user input for selecting one image. According to one implementation, the processor **720** may sequentially (or successively) display areas corresponding to background screens respectively in at least two states of the electronic device **700** in the selected image as a preview image on the display **710**. For example, the processor **720** may successively display an area of an image to be displayed as a background screen in a detected current state of the electronic device **700** and an area of an image to be displayed as a background screen in another state different from the current state as a preview image on the display **710**.

When the detected state of the electronic device **700** is the first state, the processor **720** may sequentially (or succes-

sively) display a first preview image corresponding to preview for a background screen in the first state and a second preview image corresponding to preview for a background screen in the second state on the display **710** which is in the first state. The first preview image may include a first area of the selected image. The first area may be specified by a user input. The second preview image may include a second area of the selected image. The processor **720** may specify the second area in the selected image based on the specified first area. The processor **720** may specify the first area and the second area including the first area and one area (e.g., a third area) adjacent to the first area. For example, when the detected state of the electronic device **700** is the first state, the processor **720** may display the first area of the selected image as a preview image, and then display the second area including the first area of the image and one area (e.g., the third area) adjacent to the first area as a preview image on the display **710**. The processor **720** may change display attribute (e.g., transparency, saturation, or brightness) of at least a portion of the second preview image.

When the detected state of the electronic device **700** is the second state, the processor **720** may sequentially (or successively) display a third preview image corresponding to the second state and a fourth preview image corresponding to the first state on the display **710** which is in the second state. The third preview image may include a fourth area of the selected image. The fourth area may be specified by a user input. The fourth preview image may include a fifth area of the selected image. The processor **720** may specify a fifth area in the selected image based on the specified fourth area. The processor **720** may specify one area in the fourth area as the fifth area. For example, when the detected state of the electronic device **700** is the second state, the processor **720** may display the fourth area of the selected image as a preview image, and then display the fifth area as one area within the fourth area of the image as a preview image. The processor **720** may change display attribute (e.g., transparency, saturation, or brightness) of the fourth preview image. According to one embodiment, the third preview image may be substantially identical to the second preview image, and the fourth preview image may be substantially identical to the first preview image. For example, the fourth area of the image may be substantially equal to the second area of the image, while the fifth area of the image may be substantially equal to the first area of the image.

The processor **720** may detect a state change of the electronic device **700**. When the processor **720** detects a state change of the electronic device **700**, the processor **720** may change and display a preview image in a corresponding manner to the state change of the electronic device **700** on the display **710**. For example, when the extended state of the electronic device **700** is detected, the processor **720** may extend and display the first area in the first preview image or the second preview image in proportion to the extension of the display area of the display **710**. In another example, when the retracted state of the electronic device **700** is detected, the electronic device **700** may reduce and display the third preview image in proportion to the reduction of the display area of the display **710**.

Hereinafter, with reference to FIG. **8**, an electronic device according to one embodiment will be described.

FIG. **8** is a diagram illustrating the electronic device **800** that displays preview images **820** and **830** according to an embodiment of the disclosure. Hereinafter, an operation of the electronic device **800** may be referred to as an operation of a processor (e.g., the processor **120** in FIG. **1**).

Referring to FIG. **8**, the electronic device **800** according to one embodiment may display the preview images **820** and **830** for a background screen to be set based on a specified image on a display **810**. The specified image may be an image selected by a user input for selecting an image. For example, the electronic device **800** may display the preview images **820** and **830** for the background screen on the display **810** in response to execution of a background screen setting application. According to one embodiment, the electronic device **800** may display a changed (or replaced) image as the preview images **820** and **830** based on a user input (e.g., a user input for an image replacement icon).

When the electronic device **800** according to one embodiment is in the first state (e.g., the retracted state), the electronic device **800** may display the first preview image **820** corresponding to a background screen in the first state state) and the second preview image **830** corresponding to a background screen corresponding to the second state (e.g., the extended state) the display **810** which is in the first state. The electronic device **800** according to one embodiment may display sequentially (or successively) one and the other of the first preview image **820** and the second preview image **830** based on a current state of the electronic device **800**. The electronic device **800** according to one embodiment may display sequentially the first preview image **820** and the second preview image **830** when the current state of the electronic device **800** is the first state. For example, the electronic device **800** may display the first preview image **820** for a specified time duration and then display the second preview image **830** on the display **810** which is in the first state. In another example, the electronic device **800** may alternately display the first preview image **820** and the second preview image **830** on the display **810**. According to one embodiment, the electronic device **800** may display sequentially (or successively) the first preview image **820** and the second preview images **830** on the display **810**, based on a user input (e.g., touch, swipe) to one user interface (e.g., an icon for background screen setting).

The first preview image **820** may correspond to a background screen displayed in the first state of the electronic device **800**. An aspect ratio of the first preview image **820** may correspond to an aspect ratio of a reduced display area of the display **810** visually exposed in the first state of the electronic device **800**. The first preview image **820** may include at least one area of an image. For example, the first preview image **820** may include a first area **861** of the image. The first area **861** may be specified (or changed) based on a user input (e.g., touch, swipe).

The second preview image **830** may correspond to a background screen displayed in the second state of the electronic device **800**. The aspect ratio of the second preview image **830** may correspond to an aspect ratio of an enlarged display area of the display **810** visually exposed in the second state of the electronic device **800**. The second preview image **830** may include the first area **861** of the image and at least one area adjacent to the first area **861**. According to one embodiment, the second preview image **830** may include the first area **861** of the image and one area of the image adjacent to the first area **861** of the image in an extending direction (e.g., +x direction) of the display **810** in the second state of the electronic device **800**. For example, the second preview image **830** may include a second area **862** composed of the first area **861** of the image, and a third area **863** adjacent to the first area **861**. The display **810** of the electronic device **800** may extend in one direction (e.g., +x direction). In this case, the electronic device **800** may specify the first area **861** of the image and the third area **863**

of the image adjacent to the first area **861** in the extending direction (e.g., the +x direction) as the second area **862**. However, the extending direction of the display **810** is not limited as shown in FIG. **8**. For example, the display **810** may extend in the −x direction or the y direction. In another example, the display **810** may extend in multiple directions.

The electronic device **800** may apply a specified effect when the first preview image **820** has been switched to the second preview image **830**. For example, the electronic device **800** may display the first area **861** of the image, and may display the third area **863** of the image in addition to the first area **861** such that the third area **863** gradually appears in the extending direction (e.g., +x direction). The electronic device **800** according to one embodiment may use the display **810** to set the display attribute (e.g., transparency, saturation or brightness) of at least a portion of the second area **862** of the image in the second preview image **830** to be different from that of a remaining portion of the second area **862**. The electronic device **800** may display the first area **861** of the image based on first display attribute, and display the third area **863** based on second display attribute that is at least partially different from the first display attribute. The electronic device **800** according to one embodiment may display the image such that the transparency of the third area **863** is higher than that of the first area **861**. For example, the electronic device **800** may set the transparency of the first area **861** of the image to 0% and the transparency of the third area **863** to 50% and display the first and third areas on the display **810**. When the electronic device **800** which is in the first state displays the second preview image **830** corresponding to the second state, the electronic device **800** may set the display attribute of the first area **861** and the display attribute of the third area **863** to be different from each other. Thus, an image area (e.g., the third area **863**) that is additionally displayed when the display **810** extends may be intuitively identified by the user.

The electronic device **800** according to an embodiment may display a user interface (i.e., first icon **851**, and first information **852**) related to the background screen setting. For example, the user interface (i.e., first icon **851**, and first information **852**) may include a first icon **851** and first information **852** for background screen setting. For example, the first information **852** may include "Set a background screen in consideration of a to-be-slidably-extended range". The user interface (i.e., first icon **851**, and first information **852**) shown in FIG. **8** is only example. The disclosure is not limited to the illustrated example.

When receiving a user input to the first icon **851** from the user, the electronic device **800** may specify (or set) an image selected based on the first preview image **820** and the second preview image **830** as a background screen of the electronic device **800**. For example, the electronic device **800** may set the background screen in the first state in response to selection of the first preview image **820** and set the background screen in the second state in response to selection of the second preview image **830**. When the background screen has been set by the user input to the first icon **851**, the electronic device **800** may display the background screen corresponding to the first preview image **820** on the display **810** which in in the retracted state, and may display the background screen corresponding to the second preview image **830** on the display **810** which in in the extended state.

FIG. **9** shows a first area **911** (e.g., the first area **861** of FIG. **8**) of an image **910** included in a first preview image (e.g., the first preview image **820** of FIG. **8**), and a second area **912** (e.g., the second area **862** of FIG. **8**) of the image **910** included in a second preview image (e.g., the second preview image **830** of FIG. **8**) in an electronic device (e.g., the electronic device **800** of FIG. **8**) according to one embodiment.

Referring to FIG. **9**, the electronic device which is in the first state (e.g., the retracted state) may specify one area of the image **910** as the first area **911** based on a user input (or execution of a background screen setting application).

The electronic device may specify the second area **912** of the image **910** based on the first area **911**. For example, the electronic device may specify the first area **911** and the third area **913** adjacent to the first area **911** in one direction (e.g., +x direction) as the second area **912**. However, a location of the third area **913** shown in FIG. **9** is only an example. The disclosure is not limited thereto. The location of the third area **913** may be determined based on the extending direction of the display of the electronic device. For example, the electronic device may specify the first area **911** and an area adjacent to the first area **911** in another direction (e.g., −x direction or y direction) as the third area **913**.

Hereinafter, with reference to FIG. **10**, an electronic device according to one embodiment will be described.

FIG. **10** is a diagram showing the electronic device that displays a preview image according to an embodiment of the disclosure. Hereinafter, an operation of the electronic device may be referred to as an operation of a processor (e.g., the processor **120** in FIG. **1**).

Referring to FIG. **10**, an electronic device **1000** according to one embodiment may display preview images **1020** and **1030** on the display **1010**. For example, the electronic device **1000** may display the preview images **1020** and **1030** for the background screen on the display **1010** in response to execution of the background screen setting application. According to one embodiment, the electronic device **1000** may display a changed (or replaced) image as the preview images **1020** and **1030** based on a user input (e.g., user input to an image replacement icon).

While the electronic device **1000** according to an embodiment is in the second state (e.g., the extended state), the electronic device **1000** may display a third preview image **1020** corresponding to the background screen in the second state and a fourth preview image **1030** corresponding to the background screen in the first state (e.g., the retracted state) on the display **1010**. The third preview image **1020** may be substantially identical to the second preview image **830** of FIG. **8**, while the fourth preview image **1030** may be substantially identical to the first preview image **820** of FIG. **8**. The electronic device **1000** according to one embodiment may display sequentially (or successively) one and the other of the third preview image **1020** and the fourth preview image **1030** based on a current state of the electronic device **1000**. The electronic device **1000** according to one embodiment may sequentially display the third preview image **1020** and the fourth preview image **1030** when the current state of the electronic device **1000** is the second state. For example, the electronic device **1000** may display the third preview image **1020** for a specified time duration and then display the fourth preview image **1030** on the display **1010** which is in the second state. In another example, the electronic device **1000** may alternately display the third preview image **1020** and the fourth preview image **1030** on the display **1010**. According to one embodiment, the electronic device **1000** may display sequentially (or successively) the third preview image **1020** and the fourth preview image (**1030**) on the display **1010**, based on the user input (e.g., touch, swipe) to an icon (e.g., an icon for background screen setting).

The third preview image **1020** may correspond to a background screen displayed in the second state of the

electronic device **1000**. An aspect ratio of the third preview image **1020** may correspond to an aspect ratio of an extended display area of the display **1010** visually exposed in the second state of the electronic device **1000**. The third preview image **1020** may include at least one area of the image. For example, the third preview image **1020** may include a fourth area **1061** of the image. The fourth area **1061** may be substantially the same as the second area **862** of FIG. **8**. The fourth area **1061** may be specified (or changed) by a user input (e.g., touch, swipe).

The fourth preview image **1030** may correspond to a background screen displayed in the first state of the electronic device **1000**. An aspect ratio of the fourth preview image **1030** may correspond to an aspect ratio of the reduced display area of the display **1010** visually exposed in the first state of the electronic device **1000**. The fourth preview image **1030** may include a fifth area **1062** of the image. The fifth area **1062** may be substantially the same as the first area **861** of FIG. **8**. The fifth area **1062** of the image may be included in one area within the fourth area **1061**. According to one embodiment, the fourth area **1061** may further include one area of the image adjacent to the fifth area **1062** of the image in the extending direction (e.g., +x direction) of the display **1010**.

The electronic device **1000** may apply a specified effect when the device switches the third preview image **1020** to the fourth preview image **1030**. For example, the electronic device **1000** may display the fourth area **1061** of the image, and then may display the fifth area **1062** such that an area of the fourth area **1061** other than fifth area **1062** gradually disappears in a retracting direction (e.g., −x direction).

The electronic device **1000** according to an embodiment may change the display attribute (e.g., transparency, saturation or brightness) of the fourth preview image **1030**, and may display the fourth preview image **1030** to which the changed display attribute is applied on the display **1010**. The electronic device **1000** may display the third preview image **1020** based on first display attribute, and display the fourth preview image **1030** based on second display attribute which is at least partially different from the first display attribute. The electronic device **1000** according to one embodiment may display the fourth preview image **1030** at transparency higher than transparency of the third preview image **1020**. For example, the electronic device **1000** may set the transparency of the third preview image **1020** to 0% and set the transparency of the fourth preview image **1030** to 50% and display the same on the display **1010**.

The electronic device **1000** according to an embodiment may display a user interface (i.e., first icon **1051**, and first information **1052**) related to background screen setting. For example, the user interface (i.e., first icon **1051**, and first information **1052**) may include a first icon **1051** and first information **1052** for background screen setting. For example, the first information **1052** may include "Set a background screen in consideration of a to-be-slidably-retracted range". The user interface **1051** and **1052** shown in FIG. **10** is only an example. The disclosure is not limited to the illustrated example.

Upon receiving the user input to the first icon **1051** from the user, the electronic device **1000** may specify (set) an image selected based on the third preview image **1020** and the fourth preview image **1030** as the background screen of the electronic device **1000**. For example, the electronic device **1000** may set the background screen in the second state in response to selection of the third preview image **1020** and set the background screen in the first state in response to selection of the fourth preview image **1030**. When the background screen has been set by the user input to the first icon **1051**, the electronic device **1000** may display a background screen corresponding to the third preview image **1020** on the display **1010** which in in the extended state, and a background screen corresponding to the fourth preview image **1030** on the display **1010** which is in the retracted state.

FIG. **11** shows a fourth area **1111** (e.g., the fourth area **1061** of FIG. **10**) of an image **1110** included in a third preview image (e.g., the third preview image **1020** of FIG. **10**), and a fifth area **1112** (e.g., the fifth area **1062** of FIG. **10**) of the image **1110** included in a fourth preview image (e.g., the fourth preview image **1030** of FIG. **10**) in an electronic device (e.g., the electronic device (**1000**) of FIG. **10**) according to an embodiment of the disclosure.

Referring to FIG. **11**, the electronic device which is in the second state (e.g., the extended state) may specify one area of an image **1110** as a fourth area **1111** based on a user input (or execution of a background screen setting application).

The electronic device may specify a fifth area **1112** of the image **1110** based on the fourth area **1111**. The electronic device may specify a partial area of the fourth area **1111** in the image as the fifth area **1112**. A location of the fifth area **1112** in the fourth area **1111** may be determined based on the retracting direction of the display of the electronic device. For example, the electronic device may specify one area located in the retracting direction (e.g., −x direction) of the display in the fourth area **1111** of the image as the fifth area **1112** and specify one area located in the extending direction (e.g., +x direction) of the display in the fourth area **1111** of the image as the sixth area **1113**. For example, the fourth area **1111** of the image may include the fifth area **1112** and the sixth area **1113** adjacent to the fifth area **1112**. However, positions of the fourth area **1111** and the fifth area **1112** shown in FIG. **11** are only examples. The disclosure is not limited thereto.

Hereinafter, with reference to FIG. **12**, an electronic device according to one embodiment will be described.

FIG. **12** is a view showing a preview image according to a state of the electronic device according to an embodiment of the disclosure.

Referring to FIG. **12**, a state of the electronic device **1200** according to an embodiment may include a first state **1201** (e.g., a retracted state) in which the display **1210** has retracted, the second state **1203** in which the display **1210** has extended (e.g., an extended state) and a third state **1202** (e.g., an intermediate state) in which a portion of the display **1210** has retracted or extended. As the state of the electronic device **1200** is gradually changed to the first state **1201**, the third state **1202**, and the second state **1203**, the display area of the display **1210** may be gradually enlarged.

The electronic device **1200** of the first state **1201** may display a preview image **1220** (e.g., the second preview image **830** of FIG. **8**) on the display **1210**. The preview image **1220** displayed on the display **1210** of the electronic device **1200** in the first state **1201** may include a second area **1222** including a first area **1221** of a selected image and a third area **1223** adjacent to the first area **1221** in an extending direction (e.g., +x direction) of the display **1210**. The first area **1221** of the image displayed on the display **1210** of the electronic device **1200** in the first state **1201** may correspond to the background screen displayed in the first state **1201** of the electronic device **1200**. The second area **1222** of the image may correspond to a background screen displayed in the second state **1203** of the electronic device **1200**. An aspect ratio of the first area **1221** of the image may correspond to an aspect ratio of a display area of the display **1210**

visually exposed in the first state **1201** of the electronic device **1200**. An aspect ratio of the second area **1222** of the image may correspond to an aspect ratio of the enlarged display area of the display **1210** visually exposed in the second state **1203** of the electronic device **1200**.

The electronic device **1200** which is in the first state **1201** may use the display **1210** to set display attribute (e.g., transparency, saturation, brightness of at least a portion of the second area **1222** of the image in the preview image **1220** to be different from that of a remaining portion thereof. The electronic device **1200** which is in the first state **1201** may display the first area **1221** of the image based on first display attribute, and may display the third area **1223** based on second display attribute which is at least partially different from the first display attribute. The electronic device **1200** according to one embodiment may set the transparency of the third area **1223** of the image to be higher than that of the first area **1221**. For example, the electronic device **1200** may set the transparency of the first area **1221** of the image to 0% and the transparency of the third area **1223** to 50% and display the same on the display **1210**. The electronic device **1200** according to one embodiment may extend and display an area displayed based on the display attribute in the preview image **1220** in proportion to the extension of the display area of the display **1210** as the state of the electronic device **1200** is changed from the first state **1201** to the second state **1203**.

The electronic device **1200** of the third state **1202** may display a preview image **1230** on the display **1210**. The preview image **1230** displayed on the display **1210** of the electronic device **1200** in the third state **1202** may include a second area **1222** including the sixth area **1224** of the selected image and a seventh area **1225** adjacent to the sixth area **1224** in the extending direction (e.g., +x direction) of the display **1210**. In the preview image **1230** displayed on the display **1210** of the electronic device **1200** in the third state **1202**, the sixth area **1224** may correspond to the background screen displayed when the third state **1202** is a current state of the electronic device **1200**. The sixth area **1224** may include the first area **1221** and one area adjacent to the first area **1221** in the extending direction of the display **1210**. The seventh area **1225** may be a remaining area except for the sixth area **1224** in the second area **1222**.

The electronic device **1200** of the third state **1202** may display the sixth area **1224** of the image based on first display attribute, and display the seventh area **1225** based on second display attribute which is at least partially different from the first display attribute. The electronic device **1200** according to one embodiment may set the transparency of the seventh area **1225** of the image to be higher than that of the sixth area **1224**. For example, the electronic device **1200** may set the transparency of the sixth area **1224** of the image to 0% and the transparency of the seventh area **1225** to 50% and display the same on the display **1210**.

As the electronic device **1200** according to an embodiment is gradually changed to the first state **1201**, the third state **1202** and the second state **1203**, the electronic device **1200** may display the preview image **1230** in a corresponding manner to a varying state of the electronic device **1200**. The electronic device **1200** may extend and display an area (e.g., the first area **1221** and the sixth area **1224**) of the image displayed based on the first display attribute in proportion to the extension of the display **1210**. As the display **1210** extends, the electronic device **1200** may reduce and display an area (e.g., the third area **1223** and the seventh area **1225**) of the image displayed based on the second display attribute.

The electronic device **1200** which is in the second state **1203** may display the preview image **1240** (e.g., the third preview image **1020** in FIG. **10**) corresponding to the background screen displayed in the second state **1203** on the display **1210**.

As the electronic device **1200** according to one embodiment is gradually changed to the first state **1201**, the third state **1202** and the second state **1203**, the electronic device **1200** may display the preview images **1220**, **1230**, and **1240** in a corresponding manner to a varying state thereof. Thus the user may intuitively grasp the change of the background screen according to the state of the electronic device **1200**.

The electronic device **1200** which is in each of the first state **1201**, the third state **1202** and the second state **1203** may display user interfaces (i.e., first icon **1251**, first information **1252**, and second information **1253**) related to the background screen setting on the display **1210**. The electronic device **1200** which is in each of the first state **1201** and the third state **1202** may display a first icon **1251** and first information **1252** for setting the background screen on the display **1210**. For example, the first information **1252** may include "Set a background screen in consideration of a to-be-slidably-retracted range". The electronic device **1200** which is in the second state **1203** may display the first icon **1251** and second information **1253** for setting the background screen on the display **1210**. For example, the second information **1253** may include "Set a background screen in consideration of a to-be-extracted range of a slide". The user interfaces **1251**, **1252**, and **1253** shown in FIG. **12** are only examples. The disclosure is not limited to the illustrated examples.

Hereinafter, with reference to FIG. **13**, an electronic device according to one embodiment will be described.

FIG. **13** is a view showing a preview image according to a state of the electronic device according to an embodiment of the disclosure.

Referring to FIG. **13**, a state of the electronic device **1300** according to an embodiment may include a second state **1301** (e.g., an extended state) in which a display **1310** has extended, a first state **1303** (e.g., a retracted state) in which the display **1310** has retracted and a third state **1302** (e.g., an intermediate state) in which a portion of the display **1310** has retracted or extended. As the state of the electronic device **1300** is gradually changed to the second state **1301**, the third state **1302**, and the first state **1303**, the display area of the display **1310** may be gradually reduced. The electronic device **1300** according to one embodiment may reduce and display preview images **1320**, **1330** and **1340** in proportional to the reduction of the display area of the display **1310** as the state of the device is changed from the second state **1301** to the first state **1303**.

The electronic device **1300** which is in the second state **1301** may display a preview image **1320** corresponding to the second state **1301** on the display **1310**. The preview image **1320** displayed on the display **1310** of the electronic device **1300** in the second state **1301** may correspond to the preview image of the background screen displayed in the second state **1301** of the electronic device **1300**. The preview image **1330** displayed on the display **1310** of the electronic device **1300** in the second state **1301** may include an eighth area **1321** of a selected image.

The electronic device **1300** which is in the third state **1302** may display the preview image **1330** on the display **1310**. The preview image **1330** displayed on the display **1310** of the electronic device **1300** in the third state **1302** may correspond to the background screen displayed in the third state **1302** of the electronic device **1300**. The preview image

1330 may be free of one area which is present in the eighth area 1321 in the preview image 1320. For example, the preview image 1330 displayed on the display 1310 of the electronic device 1300 in the third state 1302 may include a ninth area 1322 corresponding to one area within the eighth area 1321 of the image. As the electronic device 1300 according to one embodiment is gradually changed to the second state 1301, the third state 1302 and the first state 1303, the electronic device 1300 may display the preview images 1320, 1330, and 1340 based on the varying state thereof. The electronic device 1300 may reduce and display the preview image 1330 in proportion to the retraction of the display 1310.

The electronic device 1300 which is in the first state 1303 may display the preview image 1340 corresponding to the first state 1303 on the display 1310. The preview image 1340 displayed on the display 1310 of the electronic device 1300 in the first state 1303 may correspond to the preview image of the background screen displayed in the first state 1303 of the electronic device 1300. The preview image 1340 may be free of one area which is present in the ninth area 1322 in the preview image 1330. For example, the preview image 1340 displayed on the display 1310 of the electronic device 1300 in the first state 1303 may include a tenth area 1323 corresponding to one area within the ninth area 1322 of the image.

As the electronic device 1300 according to one embodiment is gradually changed to the second state 1301, the third state 1302 and the first state 1303, the electronic device 1300 may display the preview images 1320, 1330, and 1340 based on the varying state thereof. Thus, the user may intuitively grasp the change of the background screen according to the state of the electronic device 1300.

The electronic device 1300 which is in each of the first state 1303, the third state 1302 and the second state 1301 may display user interface (i.e., first icon 1351, first information 1352, and second information 1353) related to the background screen setting on the display 1310. The electronic device 1300 which is in each of the second state 1301 and the third state 1302 may display a first icon 1351 and first information 1352 for setting the background screen on the display 1310. For example, the first information 1352 may include "Set a background screen in consideration of a to-be-slidably-retracted range". The electronic device 1300 which is in the first state 1303 may display the first icon 1351 and second information 1353 for setting the background screen on the display 1310. For example, the second information 1353 may include "Set a background screen in consideration of a to-be-slidably-extended range". The user interfaces 1351, 1352, and 1353 shown in FIG. 13 are only examples. The disclosure is not limited to the illustrated examples.

FIG. 14 is a diagram showing a background screen setting screen in an electronic device according to an embodiment of the disclosure.

Referring to FIG. 14, an electronic device 1400 according to one embodiment may display a preview image 1420 (e.g., the preview image (820, 830) in FIG. 8) and a user interface (i.e., first icon 1451, first information 1452, second information 1460) for setting the background screen. The user interface (i.e., first icon 1451, first information 1452, and second information 1460) may include a first icon 1451, first information 1452, and second information 1460. For example, the first information 1452 may include "Set a background screen in consideration of a slidably-extended range". The second information 1460 may include a guide phrase that guide the user to actually slide the electronic device on the background screen setting screen. For example, the second information 1460 may include a guide phrase including content that a preview image displaying a background screen that changes according to a change in the state of the electronic device is displayed. For example, the second information 1460 may include "if you slide the device, you may see change of a background screen in a preview".

Hereinafter, with reference to FIG. 15, an operation configuration of an electronic device according to one embodiment it will be described.

FIG. 15 is a flowchart showing an operation configuration of an electronic device according to an embodiment of the disclosure. Hereinafter, an operation of the electronic device may be referred to as an operation of a processor (e.g., the processor 120 in FIG. 1).

Referring to FIG. 15, in operation 1510, the electronic device according to one embodiment may detect a current state of the electronic device. For example, the electronic device may detect a current state of the electronic device using a sensor (e.g., the sensor module 176 of FIG. 1). According to an embodiment, the electronic device may acquire state information about the current state of the electronic device. The electronic device according to one embodiment may identify the extended or retracted state of the display.

In operation 1520, the electronic device according to one embodiment may set a first area and a second area of a specified image based on the sensed current state (or acquired state information) of the electronic device. The specified image may be an image selected by a user input for selecting an image. When the current state of the electronic device detected in operation 1510 corresponds to the first state (e.g., the retracted state), in operation 1520, the electronic device may set one area of the specified image displayed as a background screen in the first state as the first area, and one area of the specified image displayed as a background screen in the second state (e.g., the extended state) as the second area. For example, the first area of the image may be set based on a user input. The electronic device may set the second area including the first area and at least one area adjacent to the first area based on the set first area. When the current state of the electronic device detected in operation 1510 corresponds to the second state (e.g., the extended state), in operation 1520, the electronic device may set one area of the specified image displayed as the background screen in the second state as the second area and one area of the specified image displayed as a background screen in the first state (e.g., the retracted state) as the first area. For example, the second area of the image may be set based on a user input. The electronic device may set the first area located in the second area based on the second area.

In operation 1530, the electronic device according to one embodiment may display the first preview image including the first area of the image and the second preview image including the second area of the image on the display. The first preview image may correspond to the background screen displayed in the first state, and the second preview image may correspond to the background screen displayed in the second state. The electronic device according to one embodiment may sequentially display the first preview image and the second preview image. For example, the electronic device may display the first preview image for a specified time duration and then display the second preview image on the display. In another example, the electronic device may display the second preview image for a specified time duration and then display the first preview image on the

display. In still another example, the electronic device may alternately display the first preview image and the second preview image on the display.

Hereinafter, with reference to FIG. **16**, an operation configuration of the electronic device according to one embodiment will be described.

FIG. **16** is a flowchart showing an operation configuration of an electronic device according to an embodiment of the disclosure. Hereinafter, an operation of the electronic device may be referred to as an operation of the processor (e.g., the processor **120** in FIG. **1**).

Referring to FIG. **16**, in operation **1610**, the electronic device according to one embodiment may display a first preview image including a first area of an image and a second preview image including a second area of the image on the display. The first preview image may correspond to a background screen displayed in the first state (e.g., the retracted state), and the second preview image may correspond to a background screen displayed in the second state (e.g., the extended state). For example, the electronic device may display the first preview image for a specified timed duration and then display the second preview image on the display. In another example, the electronic device may display the second preview image for a specified time duration and then display the first preview image on the display. In still another example, the electronic device may alternately display the first preview image and the second preview image on the display.

In operation **1620**, the electronic device according to one embodiment may detect (or identify) whether the state of the electronic device has changed. When the change in the state of the electronic device is not detected (NO), the electronic device may perform operation **1610**.

When the state change of the electronic device is detected (YES), in operation **1630**, the electronic device may change the preview image based on the changed state and display the changed preview image on the display. For example, when the extended state of the electronic device is detected, the electronic device according to one embodiment may extend and display the first area in the preview image of the first state and/or the third state in proportion to the extension of the display area of the display. In another example, when the retracted state of the electronic device is detected, the electronic device according to one embodiment may reduce and display the preview image in the second state in proportion to the reduction of the display area of the display.

Hereinafter, with reference to FIG. **17**, a method in which an electronic device (e.g., the electronic device **101** of FIG. **1**) according to one embodiment executes a background screen setting application will be described.

FIG. **17** is a diagram showing that the electronic device executes the background screen setting application according to an embodiment of the disclosure.

Referring to FIG. **17**, the electronic device according to one embodiment may display a preset background screen **1710** and at least one icon **1711** for execution of an application (e.g., the application **146** of FIG. **3**) on a first screen **1701** (e.g., a home screen).

Upon receiving a specified first user input **1715** (e.g., two drag inputs in opposite directions) to the first screen **1701**, the electronic device according to one embodiment may display a first user interface **1721** (e.g., a background screen setting icon) for execution of a background screen setting application on a second screen **1702**.

Upon receiving a second user input **1725** to the first user interface **1721**, the electronic device according to one embodiment may display at least one image **1731** on a third screen **1703**. For example, the electronic device may display at least one image **1731** stored in a memory (e.g., the memory **130** of FIG. **1**) by an album (e.g., the album (**375**) in FIG. **3**) application.

Upon receiving a third user input **1735** to one of the at least one image **1731**, the electronic device according to one embodiment may display, on the fourth screen **1704**, a second user interface **1741** including a list of screens for which background screens are to be set. For example, the second user interface **1741** may include "Home screen", "Lock screen", and "Lock and Home screens".

Upon receiving a fourth user input **1745** to the second user interface **1741** (e.g., Home screen), a background screen setting application may be executed. In response to the execution of the background screen setting application, the electronic device according to one embodiment may display, on a fifth screen **1705** (e.g., a background screen setting screen), a preview image (**1751**) for the background screen to be set based on a selected image, and an icon (**1752**) for background screen setting (e.g., the first icon **851** of FIG. **8**, the first icon **1051** of FIG. **10**, the first icon **1251** of FIG. **12**, the first icon **1351** of FIG. **13**, or the first icon **1451** of FIG. **14**).

Hereinafter, with reference to FIG. **18**, a method in which an electronic device (e.g., the electronic device **101** of FIG. **1**) according to one embodiment executes a background screen setting application is described.

FIG. **18** is a diagram showing that the electronic device executes the background screen setting application according to an embodiment of the disclosure.

Referring to FIG. **18**, is in response to execution of an album (e.g., the album (**375**) in FIG. **3**) application, the electronic device according to one embodiment may display at least one image **1811** on a first screen **1801**.

Upon receiving a first user input **1815** to one of the at least one image **1811**, the electronic device according to one embodiment may display a selected image **1821** and a first icon **1822** on a second screen **1802**.

Upon receiving a second user input **1825** to the first icon **1822**, the electronic device according to one embodiment may display a first user interface **1831** including at least one execution list that may be performed on the selected image **1821** on a third screen **1803**. For example, the first user interface **1831** may include "Details", "Set as wallpaper", "Set as Always On Display Image", "Move to Secure Folder", and "Print".

Upon receiving a third user input **1835** to the first user interface **1831** (e.g., Set as wall paper), the electronic device according to one embodiment may display, on a fourth screen **1804**, a second user interface **1841** including a list of screens for which background screens is to be set. For example, the second user interface **1841** may include "Home screen", "Lock screen", and "Lock and Home screens".

Upon receiving a fourth user input **1845** to the second user interface **1841** (e.g., Home screen), a background screen setting application may be executed. In response to execution of the background screen setting application, the electronic device according to one embodiment may display, on a fifth screen **1805** (e.g., a background screen setting screen), a preview image **1851** (e.g., the preview images **820** and **830** in FIG. **8**) for the background screen to be set based on a selected image, and an icon **1852** for background screen setting (e.g., the first icon **851** in FIG. **8**), the first icon **1051** in FIG. **10**, the first icon **1251** in FIG. **12**, the first icon **1351** in FIG. **13**, or the first icon **1451** in FIG. **14**).

An electronic device (e.g., the electronic device **101** of FIG. **1**, the electronic device **400** of FIG. **4**, the electronic

device **600** of FIG. **6**, the electronic device **700** of FIG. **7**, the electronic device **800** of FIG. **8**, the electronic device **1000** in FIG. **10**, the electronic device **1200** in FIG. **12**, the electronic device **1300** in FIG. **13** or the electronic device (**1400**) in FIG. **14**), according to an embodiment may include a display (e.g., the display **210** in FIG. **2**, the display **450** in FIG. **4**, the display **650** in FIG. **6**, the display **710** in FIG. **7**, the display **810** in FIG. **8**, the display **1010** in FIG. **10**, the display in FIG. **12 1210**, or the display **1310** in FIG. **13**) having a display area, wherein a size of the display area visually exposed in a first state of the electronic device is reduced and a size of the display area visually exposed in a second state of the electronic device is enlarged; and a processor (e.g., the processor **120** in FIG. **1** or the processor **720** in FIG. **7**) operatively connected to the display, wherein the processor may be configured to acquire state information of the electronic device, successively display one and the other of first and second preview images on the display, based on the state information of the electronic device, wherein the first preview image (e.g., the first preview image **820** of FIG. **8**, the fourth preview image **1030** of FIG. **10**, or the preview image **1340** of FIG. **13**) includes a first area (e.g., the first area **861** of FIG. **8**, the first area **911** of FIG. **9**, the fifth area **1062** of FIG. **10**, the fifth area **1112** of FIG. **11**, the first area **1221** of FIG. **12**, or the tenth area **1323** of FIG. **13**) of a specified image and corresponds to a preview image of a background screen in the first state, wherein the second preview image (e.g., the second preview image **830** of FIG. **8**, the third preview image **1020** of FIG. **10**, or the preview images **1220**, **1230**, and **1240** or the preview image **1320** of FIG. **13**) includes a second area (e.g., the second area **862** of FIG. **8**, the second area **912** of FIG. **9**, the fourth area **1061** of FIG. **10**)), the fourth area **1111** of FIG. **11**, the second area **1222** of FIG. **12**, or the eighth area **1321** of FIG. **13**) including the first area and a further area extending from the first area, and corresponds to a preview image of a background screen in the second state, and specify the image as a background screen, based on a first user input.

According to one embodiment, the further area may include a third area (e.g., the third area **863** in FIG. **8**, the third area **913** in FIG. **9**, the sixth area **1113** of FIG. **11**, or the third area **1223** of FIG. **12**) adjacent to the first area.

According to one embodiment, the processor may be configured to display the first preview image on the display having the first state when a state of the electronic device is the first state, and display the second preview image such that the third area gradually appears in one direction.

According to one embodiment, the processor may be configured to display the second preview image on the display having the second state when a state of the electronic device is the second state, and display the first preview image such that the third area gradually disappears in one direction.

According to one embodiment, when a state of the electronic device is the first state, the processor may be configured to display the first area of the image in the second preview image based on first display attribute, and display the third area of the image in the second preview image based on second display attribute at least partially different from the first display attribute.

According to one embodiment, the processor may be configured to extend and display an area of the image displayed based on the first display attribute, in proportion to extension of the display area of the display as the state of the electronic device has changed from the first state to the second state.

According to one embodiment, when a state of the electronic device is the first state, the processor may be configured to specify one area of the image as the first area, based on a second user input, and specify the second area in the image, based on the specified first area and an extending direction of the display.

According to one embodiment, when a state of the electronic device is the second state, the processor may be configured to display the first preview image based on first display attribute, and display the second preview image based on second display attribute at least partially different from the first display attribute.

According to one embodiment, the processor may be configured to reduce and display the second preview image, in proportion to reduction of the display area of the display as the state of the electronic device has changed from the second state to the first state.

According to one embodiment, when a state of the electronic device is the second state, the processor may be configured to specify one area of the image as the second area, based on a second user input, and specify the first area in the image, based on the specified second area and a retracting direction of the display.

According to one embodiment, an aspect ratio of the first area of the image corresponds to an aspect ratio of the display area of the display visually exposed in the first state, wherein an aspect ratio of the second area of the image corresponds to an aspect ratio of the display area of the display visually exposed in the second state.

According to one embodiment, the processor may be configured to, when the electronic device is in the first state, display the first preview image and, subsequently, display the second preview image, or when the electronic device is in the second state, display the second preview image and, subsequently, display the first preview image.

According to one embodiment, the processor may be configured to display, on the display, a user interface (e.g., the second information **1460** of FIG. **14**) including a guide phrase including an indication that a preview image representing a background screen varying according to change in the state of the electronic device is displayed.

According to one embodiment, the processor may be configured to display a user interface (e.g., the first icon **851** in FIG. **8**, the first icon **1051** in FIG. **10**, the first icon **1251** in FIG. **12**, the first icon **1351** in FIG. **13**, or the first icon **1451** in FIG. **14**) related to background screen setting on the display, and specify the image as a background screen, based on the first user input to the user interface.

A method for controlling an electronic device (e.g., the electronic device **101** of FIG. **1**, the electronic device **400** of FIG. **4**, the electronic device **600** of FIG. **6**, the electronic device **700** of FIG. **7**, the electronic device **800** of FIG. **8**, the electronic device **1000** in FIG. **10**, the electronic device **1200** in FIG. **12**, the electronic device **1300** in FIG. **13** or the electronic device (**1400**) in FIG. **14**) including a flexible display (e.g., the display **210** in FIG. **2**, the display **450** in FIG. **4**, the display **650** in FIG. **6**, the display **710** in FIG. **7**, the display **810** in FIG. **8**, the display **1010** in FIG. **10**, the display in FIG. **12 1210**, or the display **1310** in FIG. **13**) having a display area may be disclosed, wherein a size of the display area visually exposed in a first state of the electronic device is reduced and a size of the display area visually exposed in a second state of the electronic device is enlarged. The method may include acquiring state information of the electronic device, successively displaying one and the other of first and second preview images on the display, based on the state information of the electronic

device, wherein the first preview image (e.g., the first preview image **820** of FIG. **8**, the fourth preview image **1030** of FIG. **10**, or the preview image **1340** of FIG. **13**) includes a first area (e.g., the first area **861** of FIG. **8**, the first area **911** of FIG. **9**, the fifth area **1062** of FIG. **10**, the fifth area **1112** of FIG. **11**, the first area **1221** of FIG. **12**, or the tenth area **1323** of FIG. **13**) of a specified image and corresponds to a preview image of a background screen in the first state, wherein the second preview image (e.g., the second preview image **830** of FIG. **8**, the third preview image **1020** of FIG. **10**, or the preview images **1220**, **1230**, and **1240** or the preview image **1320** of FIG. **13**) includes a second area (e.g., the second area **862** of FIG. **8**, the second area **912** of FIG. **9**, the fourth area **1061** of FIG. **10**)), the fourth area **1111** of FIG. **11**, the second area **1222** of FIG. **12**, or the eighth area **1321** of FIG. **13**) including the first area and a further area extending from the first area, and corresponds to a preview image of a background screen in the second state, and specifying the image as a background screen, based on a first user input.

According to one embodiment, the further area may include a third area (e.g., the third area **863** in FIG. **8**, the third area **913** in FIG. **9**, the sixth area **1113** of FIG. **11**, or the third area **1223** of FIG. **12**) adjacent to the first area.

According to one embodiment, the method may include displaying the first preview image on the display having the first state when a state of the electronic device is the first state, and displaying the second preview image such that the third area gradually appears in one direction.

According to one embodiment, the method may include displaying the second preview image on the display having the second state when a state of the electronic device is the second state, and displaying the first preview image such that the third area gradually disappears in one direction.

According to one embodiment, when a state of the electronic device is the first state, the device may display the first area of the image in the second preview image based on first display attribute, and display the third area of the image in the second preview image based on second display attribute at least partially different from the first display attribute.

According to one embodiment, the method may include extending and displaying an area of the image displayed based on the first display attribute, in proportion to extension of the display area of the display as the state of the electronic device has changed from the first state to the second state.

The electronic device according to various embodiments may be one of various types of electronic devices. The electronic devices may include, for example, a portable communication device (e.g., a smartphone), a computer device, a portable multimedia device, a portable medical device, a camera, a wearable device, or a home appliance. According to an embodiment of the disclosure, the electronic devices are not limited to those described above.

It should be appreciated that various embodiments of the disclosure and the terms used therein are not intended to limit the technological features set forth herein to particular embodiments and include various changes, equivalents, or replacements for a corresponding embodiment. With regard to the description of the drawings, similar reference numerals may be used to refer to similar or related elements. It is to be understood that a singular form of a noun corresponding to an item may include one or more of the things, unless the relevant context clearly indicates otherwise. As used herein, each of such phrases as "A or B," "at least one of A and B," "at least one of A or B," "A, B, or C," "at least one of A, B, and C," and "at least one of A, B, or C," may include any one of, or all possible combinations of the items enumerated together in a corresponding one of the phrases. As used herein, such terms as "1st" and "2nd," or "first" and "second" may be used to simply distinguish a corresponding component from another, and does not limit the components in other aspect (e.g., importance or order). It is to be understood that if an element (e.g., a first element) is referred to, with or without the term "operatively" or "communicatively", as "coupled with," "coupled to," "connected with," or "connected to" another element (e.g., a second element), it means that the element may be coupled with the other element directly (e.g., wiredly), wirelessly, or via a third element.

As used in connection with various embodiments of the disclosure, the term "module" may include a unit implemented in hardware, software, or firmware, and may interchangeably be used with other terms, for example, "logic," "logic block," "part," or "circuitry". A module may be a single integral component, or a minimum unit or part thereof, adapted to perform one or more functions. For example, according to an embodiment, the module may be implemented in a form of an application-specific integrated circuit (ASIC).

Various embodiments as set forth herein may be implemented as software (e.g., the program **140**) including one or more instructions that are stored in a storage medium (e.g., internal memory **136** or external memory **138**) that is readable by a machine (e.g., the electronic device **101**). For example, a processor (e.g., the processor **120**) of the machine (e.g., the electronic device **101**) may invoke at least one of the one or more instructions stored in the storage medium, and execute it, with or without using one or more other components under the control of the processor. This allows the machine to be operated to perform at least one function according to the at least one instruction invoked. The one or more instructions may include a code generated by a complier or a code executable by an interpreter. The machine-readable storage medium may be provided in the form of a non-transitory storage medium. Wherein, the term "non-transitory" simply means that the storage medium is a tangible device, and does not include a signal (e.g., an electromagnetic wave), but this term does not differentiate between where data is semi-permanently stored in the storage medium and where the data is temporarily stored in the storage medium.

According to an embodiment, a method according to various embodiments of the disclosure may be included and provided in a computer program product. The computer program product may be traded as a product between a seller and a buyer. The computer program product may be distributed in the form of a machine-readable storage medium (e.g., compact disc read only memory (CD-ROM)), or be distributed (e.g., downloaded or uploaded) online via an application store (e.g., PlayStore™), or between two user devices (e.g., smart phones) directly. If distributed online, at least part of the computer program product may be temporarily generated or at least temporarily stored in the machine-readable storage medium, such as memory of the manufacturer's server, a server of the application store, or a relay server.

According to various embodiments, each component (e.g., a module or a program) of the above-described components may include a single entity or multiple entities, and some of the multiple entities may be separately disposed in different components. According to various embodiments, one or more of the above-described components may be omitted, or one or more other components may be added. Alternatively or additionally, a plurality of components (e.g.,

modules or programs) may be integrated into a single component. In such a case, according to various embodiments, the integrated component may still perform one or more functions of each of the plurality of components in the same or similar manner as they are performed by a corresponding one of the plurality of components before the integration. According to various embodiments, operations performed by the module, the program, or another component may be carried out sequentially, in parallel, repeatedly, or heuristically, or one or more of the operations may be executed in a different order or omitted, or one or more other operations may be added.

While the disclosure has been shown and described with reference to various embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the disclosure as defined by the appended claims and their equivalents.

The invention claimed is:

1. An electronic device comprising:

a housing;

a display having a display area including a first display area and a second display area, wherein the first display area is exposed regardless extension and reduction of the electronic device and the second display area is exposed from the housing and hidden by the housing according to respectively extension and reduction of the electronic device; and

at least one processor operatively connected to the display,

wherein the processor is configured to:

select an image for a background screen based on a first user input,

display at least one preview image corresponding to the image for setting the background screen, the at least one preview image including a first area of the image corresponding to the first display area and a second area of the image corresponding to the second display area, the first area and the second area being visually recognizable,

specify the image as the background screen, based on a first second user input, and

display a portion of the background screen corresponding to the first area of the image when the electronic device is reduced and display at least a portion of the background screen corresponding to the first and second area of the image when the electronic device is extended.

2. The electronic device of claim **1**, wherein the second area is adjacent to the first area.

3. The electronic device of claim **2**, wherein the at least one processor is further configured to:

display a first preview image on the display when the electronic device is reduced, and

display a second preview image such that the third second area gradually appears in one direction.

4. The electronic device of claim **3**, wherein the at least one processor is further configured to:

display the second preview image on the display when the electronic device is extended, and

display the first preview image such that the third second area gradually disappears in one direction.

5. The electronic device of claim **4**, wherein the at least one processor is further configured to:

when the electronic device is in areduced state, display the first preview image and, subsequently, display the second preview image or

when the electronic device is in an extended state, display the second preview image and, subsequently, display the first preview image.

6. The electronic device of claim **3**, wherein, when the electronic device is reduced, the at least one processor is further configured to:

display the first area of the image in the second preview image based on a first display attribute, and

display the second area of the image in the second preview image based on a second display attribute at least partially different from the first display attribute.

7. The electronic device of claim **6**, wherein the at least one processor is further configured to extend and display an area of the image displayed based on the first display attribute, in proportion to extension of the display area of the display as a state of the electronic device changes from the a reduced state to an extended state.

8. The electronic device of claim **3**, wherein, when the electronic device is extended, the at least one processor is further configured to:

display the first preview image based on a first display attribute and

display the second preview image based on a second display attribute at least partially different from the first display attribute.

9. The electronic device of claim **8**, wherein the at least one processor is further configured to reduce and display the second preview image, in proportion to reduction of the display area of the display as a state of the electronic device changes from an extended state to a reduced state.

10. The electronic device of claim **1**, wherein, when the electronic device is reduced, the at least one processor is further configured to:

specify one area of the image as the first area, based on a third user input, and

specify the second area in the image, based on a specified first area and an extending direction of the display.

11. The electronic device of claim **1**, wherein, when a state of the electronic device is extended, the at least one processor is further configured to:

specify one area of the image as a third area comprising the first area and the second area, based on a third user input, and

specify the first area in the image, based on a specified third area and a retracting direction of the display.

12. The electronic device of claim **1**,

wherein an aspect ratio of the first area of the image corresponds to an aspect ratio of the first display area, and

wherein an aspect ratio of the second area of the image corresponds to an aspect ratio of the second display area.

13. The electronic device of claim **1**, wherein the at least one processor is further configured to display, on the display, a user interface comprising a guide phrase including an indication that a preview image representing a background screen varying according to a change in a state of the electronic device is displayed.

14. The electronic device of claim **1**, wherein the at least one processor is further configured to:

display a user interface related to background screen setting on the display and

specify the image as a background screen, based on the second user input to the user interface.

15. A method for controlling an electronic device including a flexible display having a display area including a first display area and a second display area, wherein the first

display area is exposed regardless extension and reduction of the electronic device and the second display area is exposed from a housing of the electronic device and hidden by the housing according to respectively extension and reduction of the electronic device,

wherein the method comprises:

selecting an image

displaying at least one preview image corresponding to the image for setting the background screen, the at least one preview image including a first area of the image corresponding to the first display area and a second area of the image corresponding to the second display area, the first area and the second area being visually recognizable, specifying the image as the background screen, based on a second user input, and

displaying a portion of the background screen corresponding to the first area of the image when the electronic device is reduced and display at least a portion of the background screen corresponding to the first and second area of the image when the electronic device is extended.

16. The method of claim **15**, wherein the second area is adjacent to the first area.

17. The method of claim **16**, wherein the method comprises:

displaying a first preview image on the display when the electronic device is reduced; and

displaying a second preview image such that the second area gradually appears in one direction.

18. The method of claim **17**, wherein the method comprises:

displaying the second preview image on the display when the electronic device is extended; and

displaying the first preview image such that the second area gradually disappears in one direction.

19. The method of claim **17**, wherein, when the electronic device is reduced, the method comprises:

displaying the first area of the image in the second preview image based on a first display attribute; and

displaying the second area of the image in the second preview image based on second display attribute at least partially different from the first display attribute.

20. The method of claim **19**, wherein the method comprises:

extending and displaying an area of the image displayed based on the first display attribute, in proportion to extension of the display area of the display as a state of the electronic device changes from a reduced state to an extended state.

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